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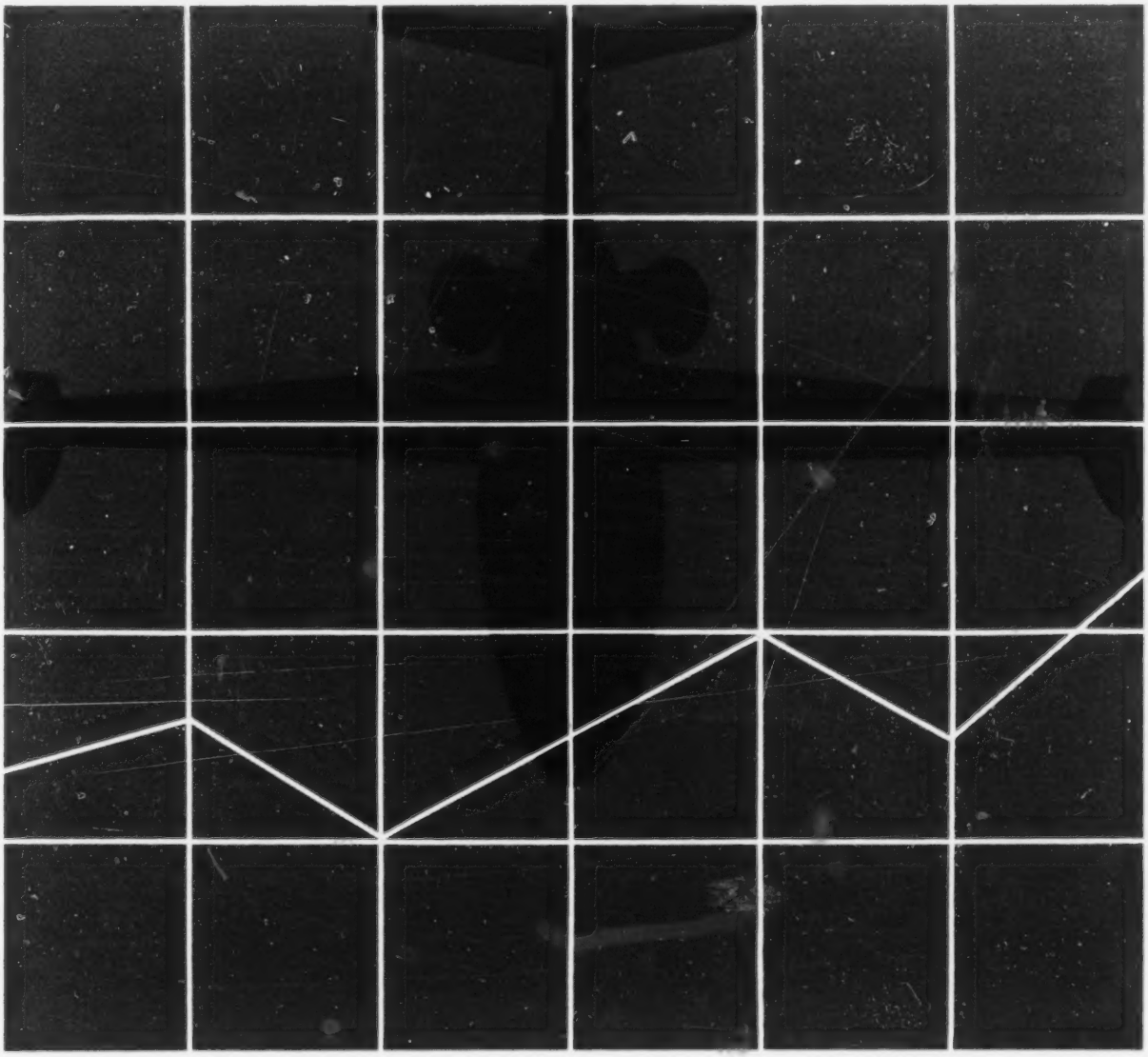
• business flying

1979 — Section 1

NATIONAL BUSINESS AIRCRAFT ASSOCIATION, INC.

Business Aircraft Productivity: 1977 Update

Analysis and comparison study of FORTUNE 1,000 companies with and without business aircraft.



Why Feature 1977 Figures in 1979?

The statistics in this report were compiled by Aviation Data Services in Wichita, Kansas. Their compilation is based on the "Fortune" magazine 1,000 largest U.S. industrial companies list. "Fortune" magazine publishes this list annually, usually in May and June. The figures are based on the previous year's activities. In this case, the "Fortune" listing was published in May and June of 1978 and the compiled data was based on the calendar year of 1977.

Aviation Data Services takes the "Fortune" 1,000 industrials list and separately compiles its business aircraft statistics. The list does not include those corporations that are utilities, insurance companies or banks.

NBAA publishes this analysis based on the figures for 1977. Figures for 1978 will not be available until later in 1979.

Distribution

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Intangible Value

How does one place a value on an aircraft to a corporation? Is it related to sales? assets? employees? stockholder equity?

Is it a useful tool? How useful? How do you measure the value? How do you account for the intangibles? Do companies with aircraft do better than companies without aircraft?

Each year Aviation Data Services of Wichita, Kansas, studies an important segment of corporate aviation—the supercorporations, the "Fortune" 1,000—those 1,000 U.S. industrial companies that are leaders in sales above all others.

NBAA analyzes these figures to give you an impression of the kind of company that uses business aircraft and the quantity and type of aircraft these successful companies use.

A comparison is made between those companies that operate aircraft and those that do not. There are many factors that contribute to a company's success; the use of aircraft is one of these many factors. No attempt is made to prove conclusively that the "Fortune" 1,000 supercorporations that operate aircraft are more successful than those that do not. Too many economic factors enter into a picture before the bottom line is reached on an income statement to single out the intrinsic value of aircraft.

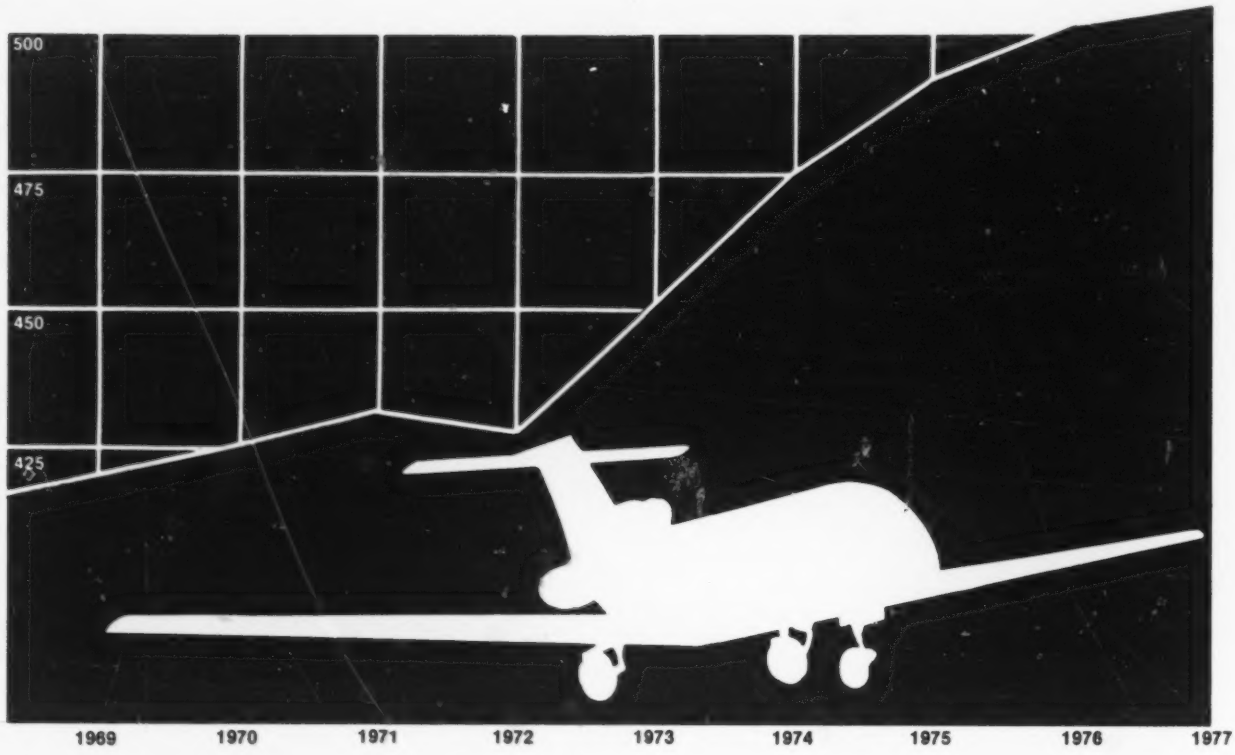
It is true that the "Fortune" 1,000 corporations that own and operate aircraft generally do better than those that do not. If a closer analysis were made, or if another item such as the size and type of their computers or the quality of their management were studied, different conclusions could be drawn.

The aircraft mix is too much of a potpourri to draw any air-tight conclusions. Some companies own one aircraft and do extremely well. Others own 10 or more and don't do as well.

More than half of the "Fortune" 1,000 companies operate aircraft. 514 companies with and 486 without. The number one company on the "Fortune" 1,000 list, General Motors, had $54.9 billion in sales and the 1,000th, Shakespeare, had $104.9 million.

Do companies with aircraft operate better? It is an unanswerable question, but it is worth taking a look at the whole company aircraft picture to see what trends are apparent and where they are going.

"Fortune" 1,000 Companies Using Business Aircraft
There were twelve more companies operating business aircraft in 1977 compared with 1976. The 514 companies, operating 1,773 aircraft, accounted for 84 percent of the sales, 86 percent of the net income, 85 percent of the assets and 80 percent of the total employees.



"Fortune" 1000 Industrial Fleet Value Increases by 25 Percent

The 514 "Fortune" 1,000 corporations that operated aircraft during 1977 accounted for 84 percent of the sales, 86 percent of the net income, 85 percent of the assets and 80 percent of the total employees. They represented an aircraft fleet at year-end of 1,773 units. Value of the fleet increased 25 percent during the year, after depreciation, topping the $1.3 billion mark. This compares to a seven and a half percent increase in units, up from 1,648 at close of 1976.

A majority of super corporations operating aircraft—67 percent in 1977—continue to be found among the top 500 industrials. The trend, however, is for a greater increase of aircraft-operators among those below the 500 level. Since 1969, there has been a 40 percent increase in aircraft operators among the second 500 companies, compared to a 17 percent increase among the top 500.

In comparing 1977 against 1976, there was 2.4 percent increase in operators among the top 500 as well as 2.4 percent increase among those between 500 and 1,000.

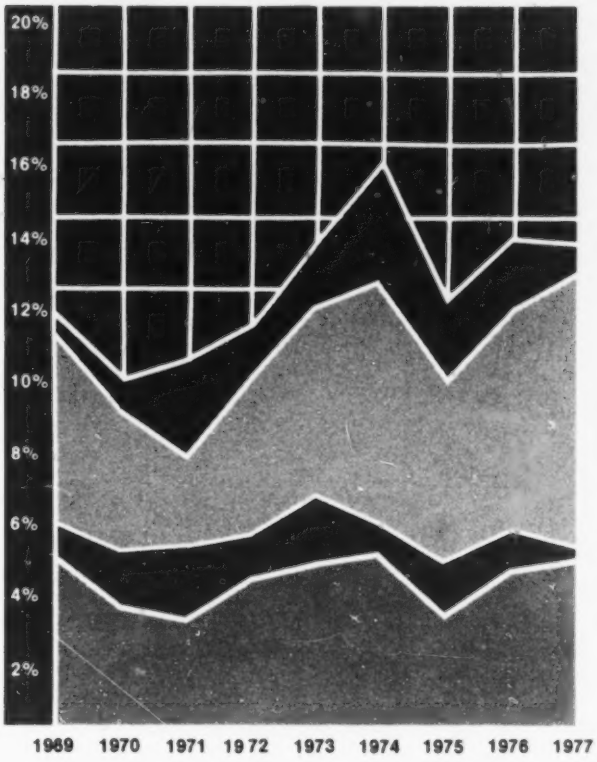
Not surprising, however, 83 percent of the "Fortune" 1,000 industrial fleet is operated by the top 500 and 43 percent by the top 100 companies alone, based on net sales. Only five companies in the top 100 did not operate aircraft during during 1977.

Newcomers

There were 21 newcomers to the "Fortune" listing during 1977 and they brought 35 aircraft into the compilation. Existing "Fortune" 1,000 companies acquired 349 new or used aircraft during the year and 21 "Fortune" companies, not previously known as aircraft operators, accounted for 25 aircraft. On the other hand, 14 companies with 25 aircraft dropped out of the top 1,000.

There were six companies that sold their aircraft—thirteen—during the year and are no longer operators; 245 aircraft flown by existing operators were either lost from service or sold. Nine of 13 companies absorbed into larger corporations operated 20 aircraft.

Net Income—Percent of Stockholder Equity and Sales
Income trends follow a fairly consistent pattern with aircraft operating companies doing one to three percent better than non-aircraft operating companies.



Business Results Differ Sharply

Value of a corporate aircraft can be a very controversial subject. Is it simply a prerequisite for the boss or a viable business tool?

The company airplane came under severe scrutiny in 1977. In spite of the increased pressure from the IRS and the SEC, the nation's top 1,000 industrial corporations, as identified by "Fortune," invested an additional $279 million in their corporate aircraft fleets.

Among the top 1,000 industrials, the differences in the business results between aircraft operators and non-operators is staggering.

There are roughly the same number of operators as there are non-operators—514 operators versus 486 non-operators.

1. New sales by aircraft-operating companies of $994.7 billion was over five times that of non-operating "Fortune" companies.
2. Corporate assets for those same 514 aircraft operators were $741.3 billion, or five and a half times those of non-operators.
3. Net income of $49 billion was six times greater.
4. Stockholders' equity of $365 billion was five and a half times greater.
5. The 13.7 million employees of operating companies were nearly four times greater than the employment of non-operating companies.
6. Net income as a percentage of sales averaged 4.9 percent for the top 1,000 industrials operating aircraft as opposed to 4.4 percent for non-operating companies.

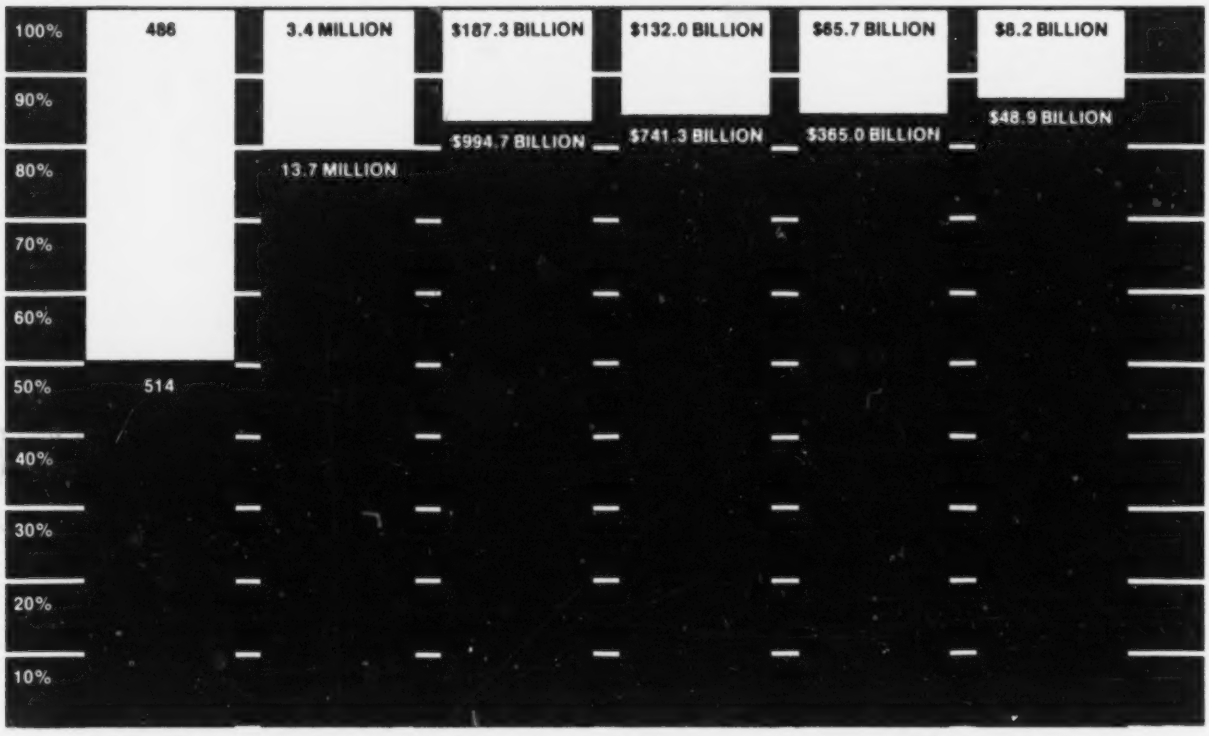
Operator Sales Equal 85% of Gross National Product

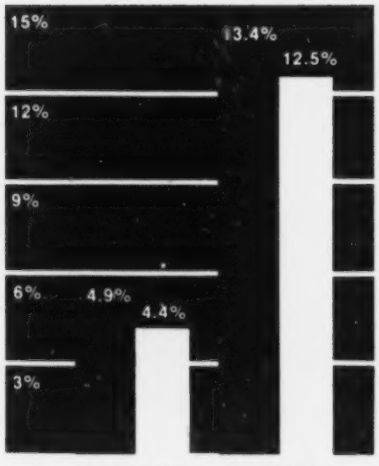
In terms of sales per employee, the 514 companies that operate aircraft bettered the non-operating companies by 33 percent, and in terms of assets per employee, by nearly 41 percent. Net income per employee for those companies operating aircraft was a substantial 49 percent higher than those companies tied to ground transportation or the commercial airlines.

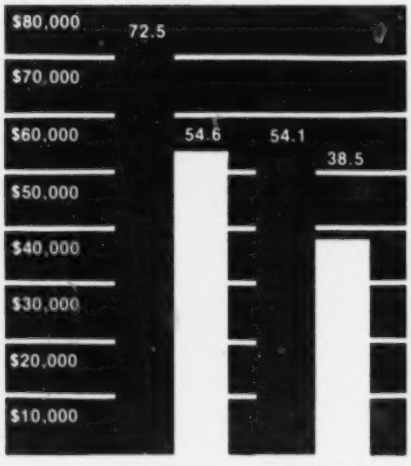
BUSINESS
AIRCRAFT OPERATORS
NON-OPERATORS

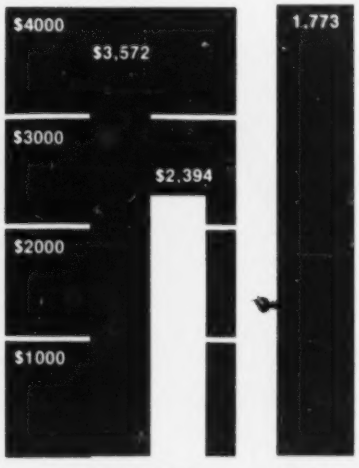
"Fortune" 1,000 Industrials Summary

New sales of aircraft operating companies were five times that of non-aircraft operating companies; corporate assets—five-and-a-half times; net income—six times; stockholder equity—five-and-a-half times; employees, four times.



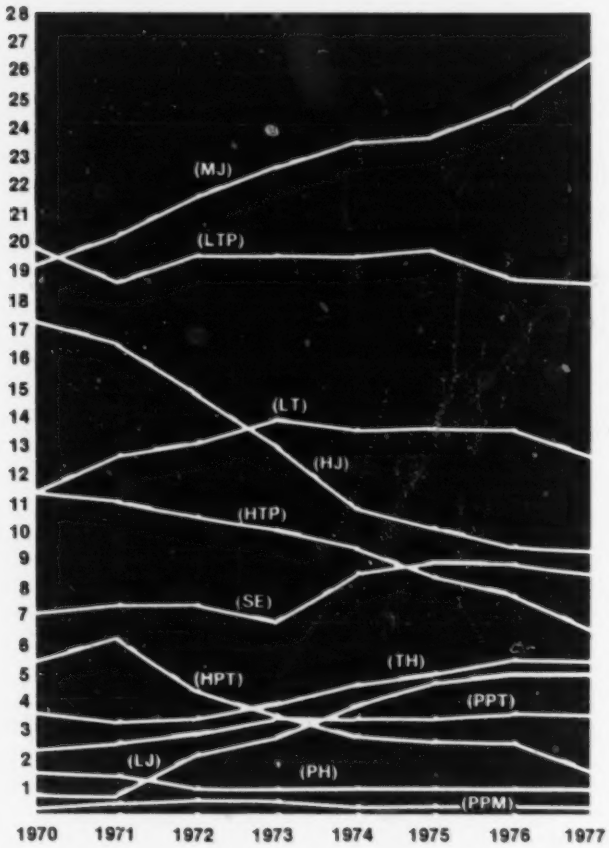






"Fortune" 1,000 Aircraft Type as Percentage of Fleet

Turbojet/turbofan aircraft outnumber all other types in the top 500 of the "Fortune" industrial list. In the second 500, it is the turboprop plane which predominates.



SE Single Engine
LT Light Piston Twin
PPT Pres. Piston Twin
HPT Heavy Piston Twin
PPM Pres. Piston 4-Eng.
LTP Light Turboprop
HTP Heavy Turboprop
LJ Light Jet
MJ Medium Jet
HJ Heavy Jet
TH Turbine Helicopter
PH Piston Helicopter

What Kind of Companies Use Business Aircraft?

There is no specific pattern to business aircraft users. The standouts are food processors, petroleum refiners and manufacturers of industrial and farm equipment. Industrial and farm equipment represents the greatest number of "Fortune" 1,000 aircraft operators at 55. This is a 56 percent of all companies in that category.

Second among operators are food processors, numbering 53. But there are another 55 food processors in the 1000 ranks, or 51 percent, that do not operate aircraft.

Of all "Fortune" 1,000 companies 10.8 percent are in food processing. They represent 10.3 percent of the 514 aircraft operators, but only 6.0 percent of the fleet.

Petroleum refiners, on the other hand, represent only 4.1 percent of the 1,000 companies, 6.2 percent of those that operate aircraft, and 17.4 percent of the "Fortune" aircraft fleet. Manufacturers of industrial and farm equipment represents the greatest number of operators at 10.7 percent, while accounting for 7.6 percent of the "Fortune" fleet.

Of the 514 operating companies, 184 or nearly 36 percent, operate only one aircraft. Six companies operate 19 or more aircraft with the largest fleet being 33.

Terms of Sales

In terms of sales, the leading SIC category among "Fortune" 1,000 non-operators is food processing with 26.5 billion in 1976. But they were soundly outdistanced by those "Fortune" 1,000 food processors that do operate aircraft, logging $77.5 billion. There are 54 non-operators in this category versus 53 operators.

The leader in sales were petroleum refiners with $261.2 billion total, of which aircraft operators captured $254.3 billion, or 97 percent of the total.

Fleet Growth

What aircraft are most popular for corporations? What aircraft are gaining in favor? What aircraft are becoming less appealing? Looking at the "Fortune" 1,000 corporate fleet, certain trends become apparent in terms of type as a percentage of the total.

The light turboprop, led the "Fortune" 1,000 fleet in 1970 with 261 units, or 19.8 percent of the total. Despite and 26.8 increase to 331 units, the light turboprop actually declined 1.2 percentage points to 18.6 percent of the "Fortune" fleet by the end of 1977. The reason: "Fortune" companies are buying more jets than they are turboprops by a significant percentage.

Biggest gainer over the seven-year period was the medium jet, which held down second place at 19.5 percent of the "Fortune" fleet at year-end 1970 and jumped 6.6 percentage points to 26.1 percent by the end of 1977. Number of medium-jet units actually increased 80.2 percent during the period, from 257 to 463.

Other significant gainers in market share were light jets, up 4.2 percentage points to 5.2 percent of the fleet; heavy jets up 1.4 percentage points to 12.6 percent of the fleet; and turbine helicopters, up 3.7 percentage points to 7.0 percent of the "Fortune" 1,000 fleet.

Single-engine aircraft showed a modest increase of 1.6 percentage points and now account for 8.5 percent of the total "Fortune" fleet.

Another gainer in the "Fortune" 1,000 marketplace during the 1970-1977 period was the pressurized piston twin, which increased a percentage point to 3.4 percent of the total fleet.

Other decliners were heavy turboprops, down 4.9 percentage points to 6.3 percent of the fleet; heavy piston twins, down 3.8 points to 1.7 percent of the fleet; and piston helicopters, down six-tenths of a point to one percent of the total fleet.

Fleet Value Increases

"Fortune" 1,000 aircraft operators spent $279.7 million for new and used equipment for 1977—a record— and took the total fleet value to just over $1.3 billion, 25 percent higher than the previous year. Of that amount, 37.6 percent, or $518.3 million was accounted for by medium jets, and 39.9 percent, or $549.5 million by heavy jets, based on dollar volume.

In terms of percentage increase in fleet value during 1977, twin turbine helicopters led the way with 59.5, followed by turbine helicopters at 47.9, heavy jets at 34.2, then pressurized piston twins at 26.2, medium jets at 24.8, and light turboprops at 22.7.

Heavy turboprops in the fleet actually dropped 14 percent in value, ending the year at 111 units averaging $510,900 each.

Seventeen heavy turboprops dropped out of the "Fortune" fleet during the year. World War II vintage DC-3's are retiring at a rapid rate contributing to a 23 percent decline in value of heavy twin pistons.

If "Fortune" 1,000 companies continue to increase the value of the fleet by the existing five-year average of 15.2 percent per year, they will have spent $209 million in 1978 and another $241.3 million in 1979 to bring the total "Fortune" fleet value to $1.8 billion by the end of 1979.

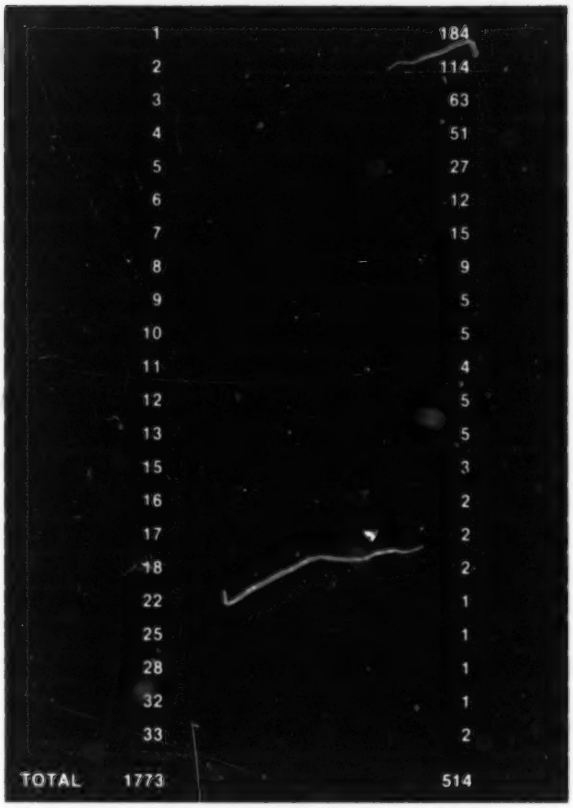
What Type of Aircraft Are Used?

In the top 500 industrials, turbojet/turbofan aircraft sharply outnumber other types. While in the bottom 500, it is the turboprop airplane that predominates in all cases.

The same is true when considering aircraft by type. The top 100 companies lead in all cases—59 percent of the piston singles, 27 percent of the piston twins, 39.8 percent of the turboprop aircraft, 42.3 percent of the turbojets/turbofans, and 68 percent of the helicopters.

Comparative Fleet Size

Single aircraft owners still dominate. Thirty-six percent of the fleet of 184 companies own one aircraft. Total number of aircraft is 1,773; total number of companies is 514.



The top 200 industrials account for 72.5 percent of the singles, 48.4 percent of the twins, 54.8 percent of the turboprop airplanes, 63.8 percent of the turbojets/turbofans, and 80.0 percent of the helicopters. Below this, 6.7 percent of the singles are operated by the 801-900 group, 9.1 percent of the twins are operated by the 301-400 and 401-500 group, 10.4 percent of the turboprops are also operated by the 301-400 group, 12.6 percent of the turbojets/turbofans are operated by the 201-300 group and 4.1 percent of the helicopters are operated by the 301-400 group.

In the "Fortune" 1,000 aircraft operator group 36 percent have only one airplane each, while 22 percent operated only two. On the other hand, 34 companies, or 6.6 percent of the "Fortune" operators, have fleets of 10 or more aircraft each. The largest fleet consists of 33 aircraft.

Comparison With NBAA Fleet

The NBAA membership fleet for the same period of time shows a close comparison to the "Fortune" 1,000 industrial fleet

NBAA Classification	Dec. 31, 1977		ADS* Classification	Dec. 31, 1977	
Jets 30,000 lbs. and over	8.7%	279	Heavy jets (HJ)	9.1%	162
Jets under 30,000 lbs.	29.7%	966	Medium & Light jets (MJ, LJ)	31.4%	556
Turbo-prop multi-engine, 12,500 lbs. and over	7.7%	250	Heavy Turbo-prop (HTP)	6.3%	111
Turbo-prop multi-engine, under 12,500 lbs.	14.3%	461	Light Turbo-prop (LTP)	18.7%	331
Piston, multi-engine, 9,000 lbs. and over	0.9%	27	Heavy Piston Twin (HPT) & 4-engine (PPM)	1.8%	33
Piston, multi-engine, 6-9,000 lbs.	9.0%	300	Pressurized Piston (PPT) Twin	3.4%	61
Piston, multi-engine, 6,000 lbs. and under	8.2%	267	Light Piston Twin (LPT)	12.7%	225
Single engine aircraft	9.1%	297	Single Engine (SE)	8.5%	151
Helicopters	12.4%	404	Turbine & Piston (TH & PH)	8.1%	143
	100%	3251	* Aviation Data Service	100%	1773

Popularity

The Beech King Air Series is most popular, based on number of units in the fleet—199 or 11.2 percent. The Dassault Falcon Series is second with 123 units.

There are 120 Learjets in the "Fortune" aircraft fleet, 119 Sabreliners, 113 Grumman G-2s, 87 Citations and 85 JetStars.

Average Age

The average year of manufacture for the entire fleet is 1970. But for jets it is 1971; turboprops, 1970; pistons, 1968; turbine helicopters, 1972; and piston helicopters, 1968.

Unit Leaders

All in all, there are 137 different models of aircraft contained in the "Fortune" 1,000 fleet produced by 46 manufacturers. Eight manufacturers alone accounted for 73.7 percent of the total 1977 fleet and 89 percent of the dollar value. Together, Beech, Cessna, Dassault, Grumman, Hawker-Siddeley, Gates Learjet, Lockheed and Rockwell International represented 1,307 units valued at $1.2 billion.

Beech led in total units with 292, followed by Cessna with 262, Grumman with 203 and Rockwell with 154. Grumman was by far the leader in dollar value with $363.2 million, followed by Lockheed with $191.2 million and Dassault with $159.5 million. The remaining five all accounted for dollar values in excess of $64.5 million.

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business flying

1979—Section2

NATIONAL
BUSINESS AIRCRAFT
ASSOCIATION, INC.

Member Profile:
A Survey of Chief Pilots

I Introduction

What is a typical NBAA member company? How many employees does it have? What is the size of its aviation department? How many pilots are there? How many maintenance men?

How are aircraft utilized by NBAA member companies? What is the average passenger load per trip? Stage length? Elapsed time?

What are the duties of the chief pilot?

"Business Flying" answers these questions and more. This issue contains the results of a survey of NBAA chief pilots. It was commissioned by Dow-Jones, Inc., as a marketing tool for its subsidiary, The Wall Street Journal. The actual survey was conducted by an independent research organization.

Because of the excellent response to the questions by NBAA chief pilots, the results of this survey provide a profile of typical NBAA membership operation, and give useful information about business flying.

II Methodology

Neither Dow-Jones nor the Wall Street Journal were identified in any way. A separate and independent research firm, Scarborough Research Corporation, conducted the survey without revealing the source of the originator.

Scarborough started with the corporate/business class membership list from the NBAA Directory. It sent a questionnaire to 1,000 chief pilots on the NBAA list. Scarborough received 694 answers to its questionnaire. This represented an astounding *56.7 percent of the members on the NBAA corporate/business classification list at the time the survey was taken in December, 1977.*

TV rating surveys and media pollsters, by comparison, make predictions on samplings of less than one percent.

NBAA membership represents a cross section of all business aircraft operators, so it is a logical step to accept this data as a good representative sampling of business aircraft operation.

The questionnaire was aimed at and sent to the chief pilot. If the title of "chief pilot" was listed in the NBAA Membership Directory with an aviation department manager, director of aviation or similar title, the questionnaire was sent directly to the chief pilot. If there was no chief pilot listed, the questionnaire was sent to the highest title authority in the aviation department.

The NBAA Recommended Standards Manual describes the difference as follows:

"When the aviation department has several aircraft and crews in addition to a maintenance department the administrative duties multiply and the title is usually Aviation Department Manager. In this position, there may be a requirement to inter-relate the activities of the aviation department with other corporate functions (i.e., developing uses for the aircraft not only to satisfy transportation requirements but to integrate the aircraft into marketing programs, customer, public relations or humanitarian missions, etc.) In the larger operations, a Chief Pilot can be appointed and duties delegated to that individual which primarily relate to crew schedules, recurrent training, standardization, etc. The aviation department manager, in this case, will find that administrative duties are a primary responsibility.

In single or two aircraft operations, Chief Pilot is the more common term although the responsibilities for flying and administration may overlap."

The questionnaire was sent along with a stamped envelope and asked for the chief pilot's help. The recipient was asked to pass the questionnaire along to the new chief pilot if the receiver had changed positions. A dollar bill was included as an extra incentive to stimulate responses.

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Note: In each chart, the "Number" column refers to the amount of chief pilots answering the specific question.

Company Profile

Almost one out of every two chief pilots indicates that manufacturing is the primary business of his company.

The median company has 2,117 employees.

The choice of purchasing rather than leasing aircraft is at the ratio of eight to one.

Employees

Company Size	Number	Percent
Less than 100 employees	103	14.8
100- 499	108	15.6
500- 999	54	7.8
1,000-2,499	94	13.5
2,500-4,999	91	13.1
5,000-7,499	46	6.6
7,500-9,999	27	3.9
10,000 or more	147	21.2
Not stated	24	3.5
Base: All Chief Pilots	694	100.0

Median employees: 2,117 for all plants, divisions, subdivisions and branches.

Types of Aircraft Owned and Leased

Presently Own or Lease	Number	Percent	Median
Helicopter	91	13.1	1.8
Fixed wing turboprop	316	45.5	1.6
Pure jet	388	55.9	1.8
Single engine recip	120	17.3	1.9
Multi-engine recip	262	37.8	1.8
Not stated	6	0.9	
Base: All Chief Pilots	694	100.0	

Note 1: The above adds to more than total due to multiple responses. Another NBAA survey reveals that more than 60 percent of NBAA members own one aircraft.

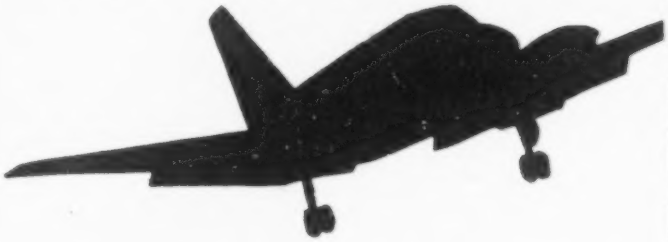
Note 2: The "Number" column refers to the "number" of chief pilots reporting, not the amount of aircraft owned or leased.

Primary Business

Type	Number	Percent
Manufacturing	327	47.1
Transportation & Communication	54	7.8
Service	44	6.3
Construction	38	5.5
Public Utilities	33	4.8
Wholesaling	30	4.3
Mining	28	4.0
Retailing	24	3.5
Agriculture, Forestry & Fisheries	23	3.3
Insurance	22	3.2
Investment banking, stock & commodity brokers	10	1.4
Financial credit agencies other than banks & holding companies	9	1.3
Banking	9	1.3
Real Estate	5	0.7
Professional	4	0.6
Government	7	1.0
Education	4	0.6
Armed Forces	1	0.1
All others	15	2.2
Not stated	28	4.0
Base: All Chief Pilots	694	100.0

Some of the chief pilots answering the survey said that their company was engaged in more than one activity. That is why the number of responses add up to more than the total of 694 surveyed. The percentages show an overwhelming concentration in manufacturing—almost one half.

Aviation Department



Including the chief pilot, one-half of all the companies have four pilots and two maintenance personnel associated with the corporate fleet.

Maintenance Personnel in Aviation Department

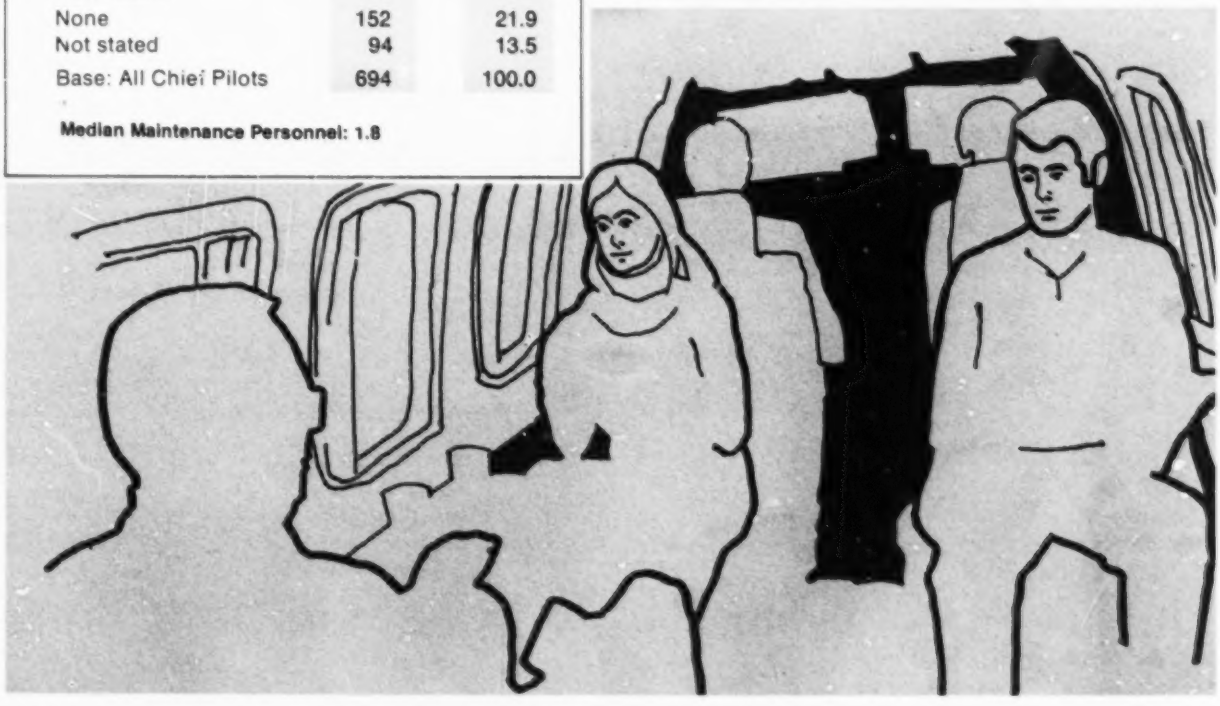
Maintenance Personnel	Number	Percent
1	195	28.1
2	90	13.0
3	38	5.5
4	23	3.3
5	20	2.9
6-10	44	6.3
11-15	14	2.0
16-20	8	1.2
21-25	4	0.6
26 or more	12	1.7
None	152	21.9
Not stated	94	13.5
Base: All Chief Pilots	694	100.0

Median Maintenance Personnel: 1.8

Additional Pilots in Aviation Department

Additional Pilots	Number	Percent
1	159	22.9
2	142	20.5
3	77	11.1
4	46	6.6
5	34	4.9
6-10	104	15.0
11-15	29	4.2
16-20	14	2.0
21-25	7	1.0
26 or more	13	1.9
None	54	7.7
Not stated	15	2.2
Base: All Chief Pilots	694	100.0

Median Pilots: 2.9 plus the chief pilot.



Operations

The median stage length of corporate aircraft is 359 miles.

The median elapsed time is 1 hour 26 minutes with at least half of the flights carrying four or more passengers.

Average Stage Length

Stage Length	Number	Percent
Less than 50 miles	6	0.9
50- 99 miles	7	1.0
100-199 miles	74	10.7
200-299 miles	157	22.6
300-399 miles	164	23.6
400 miles or more	274	39.5
Not stated	12	1.7
Base: All Chief Pilots	694	100.0

Median Stage Length: 359 miles.

Average Number of Passengers

Number of Passengers	Number	Percent
1	8	1.2
2	107	15.4
3	263	37.9
4	182	26.3
5	85	12.2
6 or more	37	5.3
Not stated	12	1.7
Base: All Chief Pilots	694	100.0

Median Number of Passengers Per Flight: 3.8

Average Elapsed Time, Office-to-Office

Elapsed Time	Number	Percent
Less than ½ hour	3	0.4
½ hour to less than 1 hour	73	10.5
1 hour to less than 1½ hour	260	37.5
1½ hour to less than 2 hours	155	22.3
2 hours to less than 2½ hours	57	8.2
2½ hours to less than 3 hours	32	4.6
3 hours to less than 3½ hours	13	1.9
3½ hours to less than 4 hours	5	0.7
4 or more hours	11	1.6
Not stated	85	12.3
Base: All Chief Pilots	694	100.0

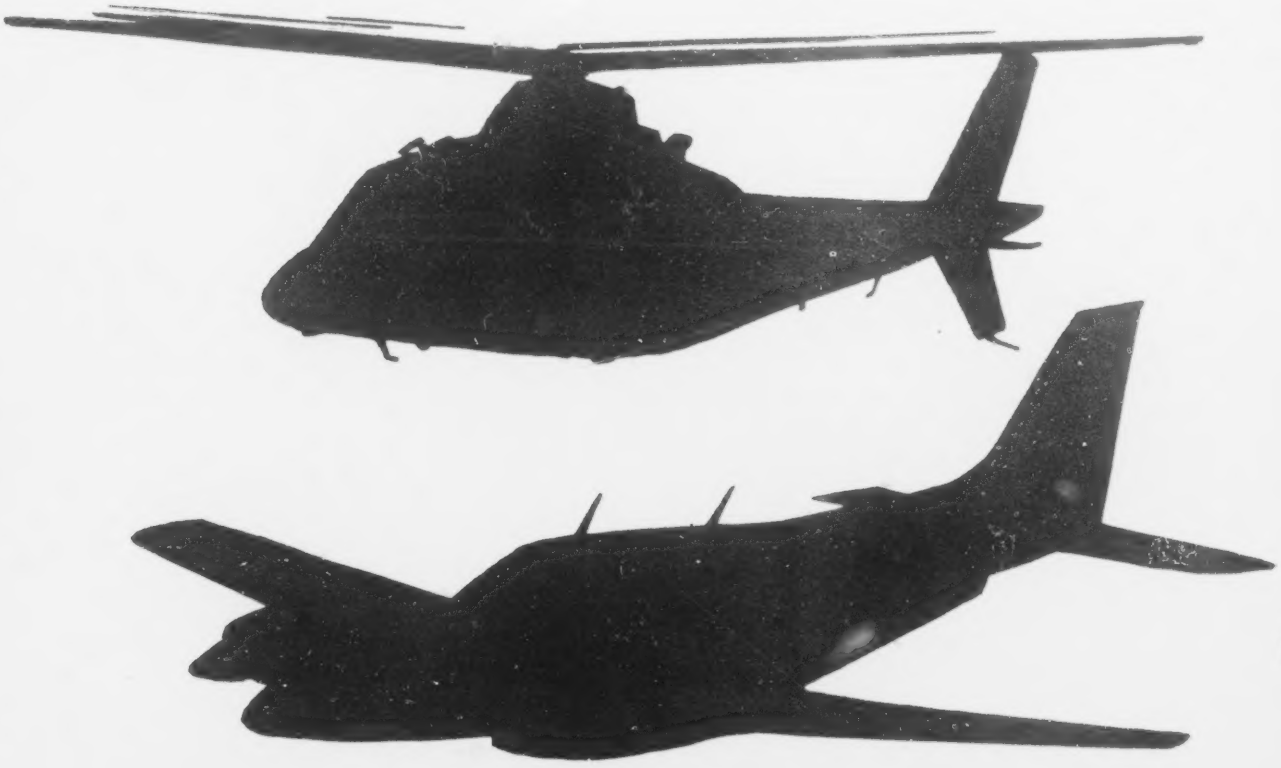
Median Elapsed Time: 1 hour 26 minutes

On company trips of 200 miles or less, 56% of all chief pilots indicated that a company plane is used.

Employee Trips—200 Miles or Less

Mode of Transportation	Number	Percent
Employee car	163	23.5
Company car	285	41.1
Scheduled airline	166	23.9
Non-scheduled airline	21	3.0
Company jet	104	15.0
Company turboprop	163	23.5
Company recip	169	24.4
Company plane (net)	388	55.9
Helicopter	40	5.8
Other	12	1.7
Not stated	35	5.0
Base: All Chief Pilots	694	100.0

Note: The above adds to more than total due to multiple responses.



Chief Pilot Role

Fifty percent of all respondents indicated having been a chief pilot for eight years or more.

In addition to flying the company aircraft, 95% of the pilots indicate that they act as a consultant on any aircraft acquisitions.

Job Responsibility

Job Responsibilities	Number	Percent
Fly the company aircraft	677	97.6
Keep abreast of new developments in aviation	666	96.0
Decide or influence new avionics purchases	658	94.8
Act as consultant in any new aircraft purchases	657	94.7
Approve bills/ invoices	647	93.2
Supervise aviation staff	586	84.4
Hire new pilots	570	82.1
Set flight plans	545	78.5
Decide or influence new purchases in cabin layout/ design	540	77.8
Maintain flight log	534	76.9
Select galley provisions	418	60.2
Set schedules	406	58.5
Hire new maintenance personnel	404	58.2
Responsible for transportation other than aircraft	165	23.8
Responsible for/ involved with budget control	43	6.2
Supervise/involved with maintenance	41	5.9
Train crew or staff	25	3.6
Other job responsibilities	97	14.0
Not stated	2	0.3
Base: All Chief Pilots	694	100.0

Note 1: The above adds to more than total due to multiple responses.

Note 2: The duties of the aviation department manager are not limited to those in the survey. The NBAA Recommended Standards Manual includes many other duties involving a range of responsibilities in administration, maintenance and operations.

Longevity

Number of Years as Chief Pilot	Number	Percent
Less than 1 year	35	5.0
1- 3 years	124	17.9
4- 5 years	114	16.4
6- 8 years	119	17.1
9-11 years	82	11.8
12-14 years	54	7.8
15 or more years	162	23.4
Not stated	4	0.6
Base: All Chief Pilots	694	100.0

Median years: 7.8

In Summary

A few facts may be deduced from this survey that give a rough profile of a typical NBAA chief pilot, his department, his company and the operation of his aircraft.

- He has been a chief pilot for 7.8 years.
- He has 2.9 pilots besides himself in the aviation department and 1.8 maintenance men.
- He works for a company that is probably engaged in a manufacturing process and employs 2,117 workers.
- His company owns or leases 1.8 aircraft that carry 3.8 passengers per flight on an average trip of 359 miles. This trip takes one hour and twenty-six minutes, door-to-door.

Of course, no one can fly 0.8 of an aircraft and you don't see many 0.9 people around, but this survey, which represents the answers of 694 or 56.7 percent of the business and corporate chief pilots in the NBAA, may be used as a practical composite profile of a business aircraft operation.

"Business Flying" is compiled and published as a membership and public information service by the National Business Aircraft Association as information relevant to business aviation becomes available.

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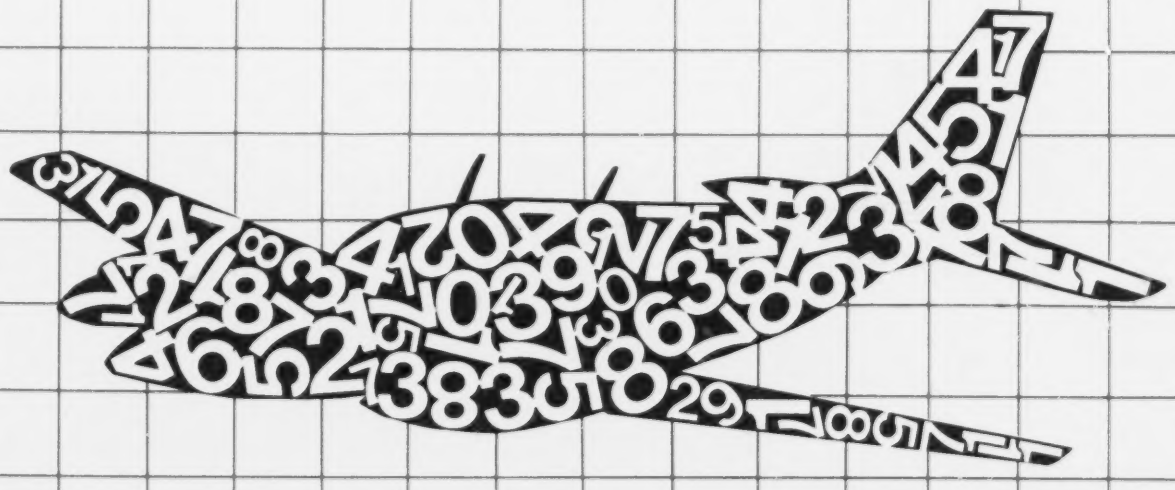
BUSINESS FLYING:
Its Statistical Status In General Aviation



Introduction

How does business flying fit into the overall general aviation picture? What kind of aircraft are used? What kind of utilization do business flyers get compared to others in general aviation? What kind of avionic sophistication do they maintain?

The Federal Aviation Administration (FAA) has published its annual compendium of general aviation statistics for 1977. (The 1978 statistics will be available in 1980.) This issue of "Business Flying" analyzes some of the FAA figures as they apply to business aviation and general aviation.

Business aviation is an important part of general aviation. The statistics in this report show the scope of business aviation and its place in general aviation.

Two changes have been introduced into federal aviation statistics gathering. One is obvious the other is not. The obvious change is that statistics for 1977 contain primary use avionics information. The not-so-obvious change is in the method FAA used to gather data. Business flying statistics used to be available by aircraft type, hours flown and miles flown. This report does contain figures for aircraft type and hours flown but mileage figures will not be available until well into 1980 because of the change in survey methods.

The changes in FAA statistical gathering this year has also made comparisons with recent years risky. The FAA has decided that the new method is the most accurate and will revise previous year figures, accordingly, but this will take some time and is not part of this report.

Summary

An estimated 35.8 million hours of flying time were logged by the 184,294 active general aviation aircraft in the U.S. fleet during 1977. These aircraft had a mean annual flight time per aircraft of 194.2 hours and represented almost 87 percent of the registered general aviation fleet.

Business aircraft logged 10.3 million hours or 28.8 percent of the total hours flown.

Turboprop and turbojet aircraft which are used primarily for business were the most heavily used aircraft in the fleet, each averaging over 500 hours per aircraft for the year. In contrast, single-engine, piston-powered aircraft averaged fewer than 175 hours per aircraft in 1977.

The most common primary use of general aviation aircraft was the "personal" category for an estimated 48 percent of the active fleet. This was followed by a combined business/executive usage of 27 percent of the fleet.

Over 80 percent of the general aviation aircraft have two-way VHF communications equipment; over 50 percent are equipped with 4096-code transponders; almost 50 percent have at least one component of an instrument landing system; and over 75 percent have some form of navigation equipment.

An estimated 35 percent of the active general aviation fleet flew by instrument flight rules (IFR) at some time during 1977.

An estimated 6.1 percent of the general aviation fleet was on long-term lease during 1977.

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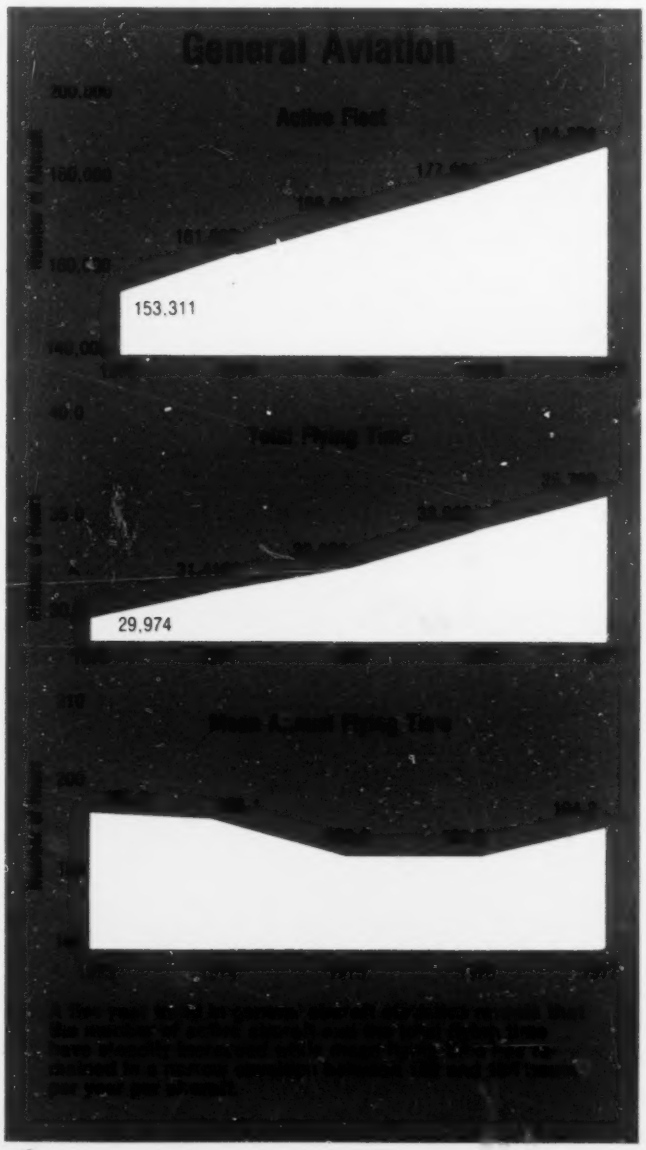


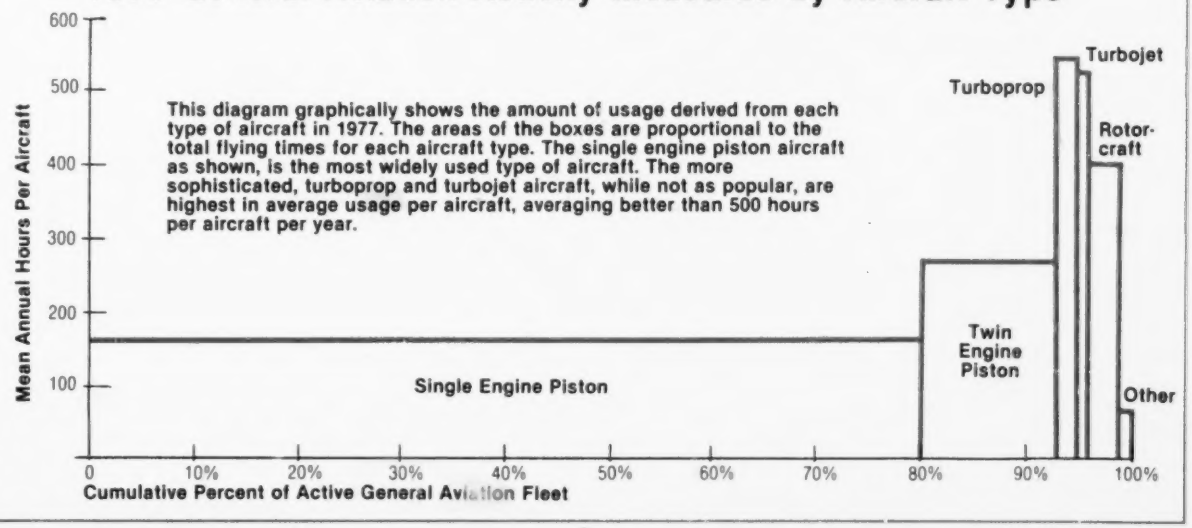
Growth of General Aviation Total Hours Flown (Thousands) Number of Aircraft 1973 - 1977

Aircraft Type	1973	1974	1975	1976	1977	Compound Annual Growth Rate in Percent
Fixed Wing						
1-engine piston	9,722	9,436	9,447	9,640	8,973	-1.98
(1-3 seats)	51,218	52,682	54,059	56,547	57,340	2.86
1-engine piston	12,025	12,994	13,467	14,688	15,944	7.31
(4 + seats)	74,856	78,830	82,580	88,205	91,960	5.28
2-engine piston	3,243	3,367	3,374	3,220	3,630	2.86
(1-6 seats)	13,454	14,182	14,663	14,617	15,074	2.88
2-engine piston	1,724	1,868	1,793	2,081	2,322	7.73
(7 + seats)	5,048	5,371	5,456	6,494	6,226	5.38
Other piston	84	95	84	84	96	3.39
	190	190	178	196	182	-1.07
2-engine turboprop	572	663	787	785	892	11.75
(1-12 seats)	1,268	1,465	1,928	1,889	2,276	15.75
2-engine turboprop	508	540	484	521	625	5.32
(13 + seats)	509	555	512	507	549	1.91
Other turboprop	37	42	36	20	32	-3.56
	72	75	64	57	64	-2.90
2-engine turbojet	595	690	755	844	1,043	15.06
	1,196	1,385	1,547	1,692	1,959	13.13
Other turbojet	89	63	71	67	122	8.20
	184	176	196	189	318	14.66
Rotorcraft						
Piston	654	729	686	753	609	-1.77
	2,122	2,315	2,498	2,701	2,658	5.79
Turbine	515	697	796	950	1,259	25.04
	993	1,282	1,556	1,724	2,067	20.12
Other	207	227	244	270	245	4.30
	2,201	2,525	2,812	3,146	3,616	13.21
Total Aircraft Hours (1,000s)	29,974	31,413	32,024	33,922	35,792	4.53
Total Active Aircraft	153,311	161,033	168,049	177,964	184,294	4.71

Hours in Black/Aircraft in Red

This combination chart shows thousands of hours flown in black and the number of active aircraft in red that fly these hours. The column at the right shows the compound growth rate, plus or minus, for each type of aircraft and for hours flown. Growth leaders are light turboprops, turbojets and turbine helicopters.

1977 General Aviation Activity Measures by Aircraft Type


600
500
400
300
200
100
Mean Annual Hours Per Aircraft
This diagram graphically shows the amount of usage derived from each type of aircraft in 1977. The areas of the boxes are proportional to the total flying times for each aircraft type. The single engine piston aircraft as shown, is the most widely used type of aircraft. The more sophisticated, turboprop and turbojet aircraft, while not as popular, are highest in average usage per aircraft, averaging better than 500 hours per aircraft per year.
Turbojet
Turboprop
Rotor-craft
Twin Engine Piston
Single Engine Piston
Other
0
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Cumulative Percent of Active General Aviation Fleet

General Aviation Total Hours Flown (in Thousands) by Aircraft and Primary Use - 1977

Hours in Black/Aircraft in Red

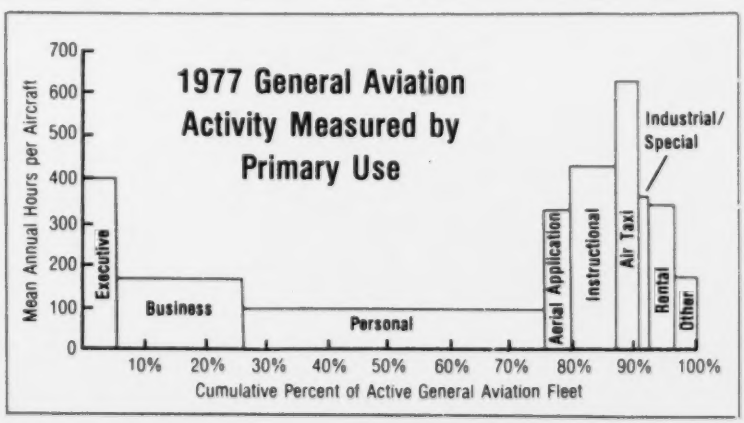
Aircraft Type	Total	Executive	Business	Personal	Aerial Appl.	Instructional	Air Taxi	Industrial	Rental	Other
Fixed Wing Piston										
1 Eng. 1-3 seats	8,972	28	442	2,590	1,785	3,255	12	76	503	304
	57,340	85	3,882	34,221	6,032	8,166	63	350	2,077	1,949
1 Eng. 4+ seats	15,943	408	4,244	5,213	17	27,078	1,032	182	1,963	137
	91,960	1,074	27,650	47,515	121	6,377	1,945	520	5,654	980
Total 1 Eng.	24,916	436	4,686	7,811	1,802	5,965	1,044	258	2,468	350
	149,300	1,159	31,533	81,737	6,154	14,543	2,009	870	7,731	2,929
2 Eng. 1-6 seats	3,630	662	1,386	425	13	217	744	7	99	694
	15,074	1,914	6,961	2,971	131	678	1,715	22	309	347
2 Eng. 7+ seats	2,321	749	406	54	32	21	910	16	60	69
	6,226	1,941	1,625	406	104	90	1,449	62	199	329
Total 2 Eng.	5,951	1,413	1,793	480	46	239	1,654	23	160	139
	21,301	3,856	8,587	3,378	235	768	3,165	85	509	677
Other Piston	96	6	2	1	8	0	68	0	15	1
	182	1	8	3	66	0	47	0	32	17
Total Piston	30,964	1,849	6,484	8,292	1,855	6,202	2,767	282	2,644	492
	170,783	5,017	40,129	85,118	6,456	15,312	5,222	955	8,273	3,624
Turboprop										
2 Eng. 1-12 seats	892	698	94	5	0	7	79	0	6	2
	2,276	1,631	367	34	0	13	179	0	12	36
2 Eng. 13+ seats	624	102	12	0	0	0	387	1	71	9
	549	182	43	4	0	0	251	4	34	27
Total 2 Eng.	1,517	800	106	6	0	7	451	2	77	11
	2,825	1,814	411	38	0	13	431	4	47	63
Other Turboprop	31	3	5	0	0	2	2	0	14	6
	64	9	8	0	0	1	3	0	16	25
Total Turboprop	1,549	804	112	6	0	7	453	1	92	17
	2,890	1,824	419	38	0	15	434	4	63	88
Turbojet										
2 Eng.	1,043	661	33	2	2	55	213	3	0	53
	1,959	1,477	99	10	6	62	208	18	0	75
Other	122	50	19	2	0	3	8	0	14	19
	318	111	74	5	0	5	9	0	29	66
Total Turbojet Est. Total Hours	1,165	711	53	2	2	59	222	1	14	73
	2,277	1,589	174	15	6	68	217	18	29	142
Total Fixed Wing	33,679	3,367	6,650	8,300	1,858	6,269	3,430	287	2,751	579
	175,951	8,432	40,723	85,172	6,462	15,396	5,874	978	8,366	3,854
Rotorcraft										
Piston	608	7	99	23	174	36	38	71	2	150
	2,658	53	353	539	869	139	86	195	6	382
Turbine	1,259	112	58	1	27	171	659	93	8	124
	2,067	290	135	10	59	170	875	166	27	332
Total Rotorcraft	1,867	120	157	239	201	207	697	165	11	275
	4,726	344	489	550	929	310	961	361	30	715
Other	244	2	11	130	0	51	0	0	30	21
	3,616	5	183	2,569	0	389	2	1	221	229
Total Aircraft Hours	35,791	3,487	6,821	8,453	2,057	6,529	4,130	453	2,792	879
Total Aircraft	184,294	8,782	41,396	88,292	7,392	16,096	6,838	1,342	8,619	4,799

Note: Row and column summations may differ from printed totals due to estimation procedures.

According to the FAA figures business and executive aircraft combined accounted for 50,000 units flying over 10 million flight hours or 28.8 percent of the total hours flown in general aviation. By FAA definition, "business" means "any aircraft used not for compensation or hire by an *individual* for the purpose of transportation required by a business in which he is engaged." "Executive" flying is the "use of an aircraft by a *corporation* for the purpose of transporting its employees and/or property, but not for compensation or hire and *employing professional flight personnel.*"

The areas of the boxes are proportional to the total flying times for the primary uses. Business and Executive flying account for 28.8 percent of the general aviation flying hours. Executive aircraft hours of utilization rate high at 400 hours per year placing third in utilization behind Air Taxis and Instructional Flying. Personal flying, which still has the most participation at 47 percent, also, has the lowest average annual flight hours per year.

Air Taxi includes both scheduled and non-scheduled flying "Aerial Application", by definition, is use of an aircraft for work purposes such as agricultural spraying. "Industrial/ Special" includes pipeline patrol, aerial surveys, aerial photography and hoisting by helicopter. "Rental," as defined, means the primary use for the aircraft is rental by the owner.



Active General Aviation Aircraft by Primary Use Category Growth (decline), 1974-77

Category		Total	Bus./Exec.	Bus./Exec. Percent of General Aviation	Air Taxi	Personal	Instruc-tional	Aer. Appl.	Industrial/ Special	Rental	Other
Aircraft	1977	184,294	56,178	27.2	6,838	88,292	16,096	7,392	1,342	8,619	879
	1976	178,304	47,836	26.8	6,791	87,329	13,366	7,850	2,695	8,837	3,600
	1974	168,817	44,803	26.5	5,214	85,016	12,963	7,591	2,503	7,115	3,612
Change	+	15,477	+5,375		+1,624	+3,276	+3,133	-199	-1,161	+1,504	-2733
Percent	+	9.1	+12		+31.1	+3.8	+3.1	-2.6	-47	+21	-76
Piston Mult. Eng.	1977	21,483	12,452	58.4	3,212	3,381	768	301	85	541	694
	1976	21,320	13,011	61.0	2,964	3,188	568	354	269	470	496
	1974	19,372	11,950	61.6	2,230	2,961	595	354	303	434	545
Change	+	2,111	+502		+982	+420	+173	-53	-218	+107	+149
Percent	+	10.8	+4.2		+44	+14.1	+29	-15	-72	24.6	+27.3
Turbojet	1977	2,277	1,763	77.4	217	15	68	6	18	29	142
	1976	1,938	1,582	81.6	177	13	17	2	5	11	131
	1974	1,287	1,167	90.6	50	31	0	0	3	1	35
Change	+	990	+596		+167	-16	68	+6	+15	+28	+107
Percent	+	76.9	+51		+434	-52					
Rotary Wing	1977	4,726	833	17.6	961	550	310	929	361	30	715
	1976	4,505	968	21.4	974	472	296	643	809	41	302
	1974	3,171	607	19.1	689	256	197	555	633	45	189
Change	+	1,555	+226		+272	+294	+113	+374	-272	-15	+526
Percent	+	49	+37		58.3	+214	+57.3	+67.3	-43	-33	+378

Business/executive aircraft consistently improved its share of general aviation primary use activity in the period between 1974 and 1977. The percentage of business aircraft steadily increased from 26.5 in 1974 to 27.2 in 1977 with heavy concentrations on multi-engine piston, turboprop and turbojet aircraft. The recent surge in business helicopter activity is not reflected in these 1977 figures. The number of aircraft involved in Aerial Application and Industrial/Specialty actually declined.

Estimated Hours (in Thousands) Flown by General Aviation Aircraft — Growth (decline) 1974-77

Category		Total	Bus./Exec.	Bus./Exec. Percent of General Aviation	Air Taxi	Personal	Instruc-tional	Aer. Appl.	Industrial/ Special	Rental	Other
Total Fixed Wing	1977	33,679	10,017	29.7	3,430	8,300	6,269	1,858	287	2,751	579
	1976	34,081	9,777	28.6	2,928	9,602	4,979	2,066	798	3,426	502
	1974	30,481	9,722	31.8	2,091	8,552	5,159	1,473	676	2,426	368
Change	+	3,198	+295		+1,339	-252	+1,110	+385	-389	+325	+211
Percent	+	10.5	+3.0		+64.0	-3.0	+21.5	+26.1	-58	+13.3	+57.3

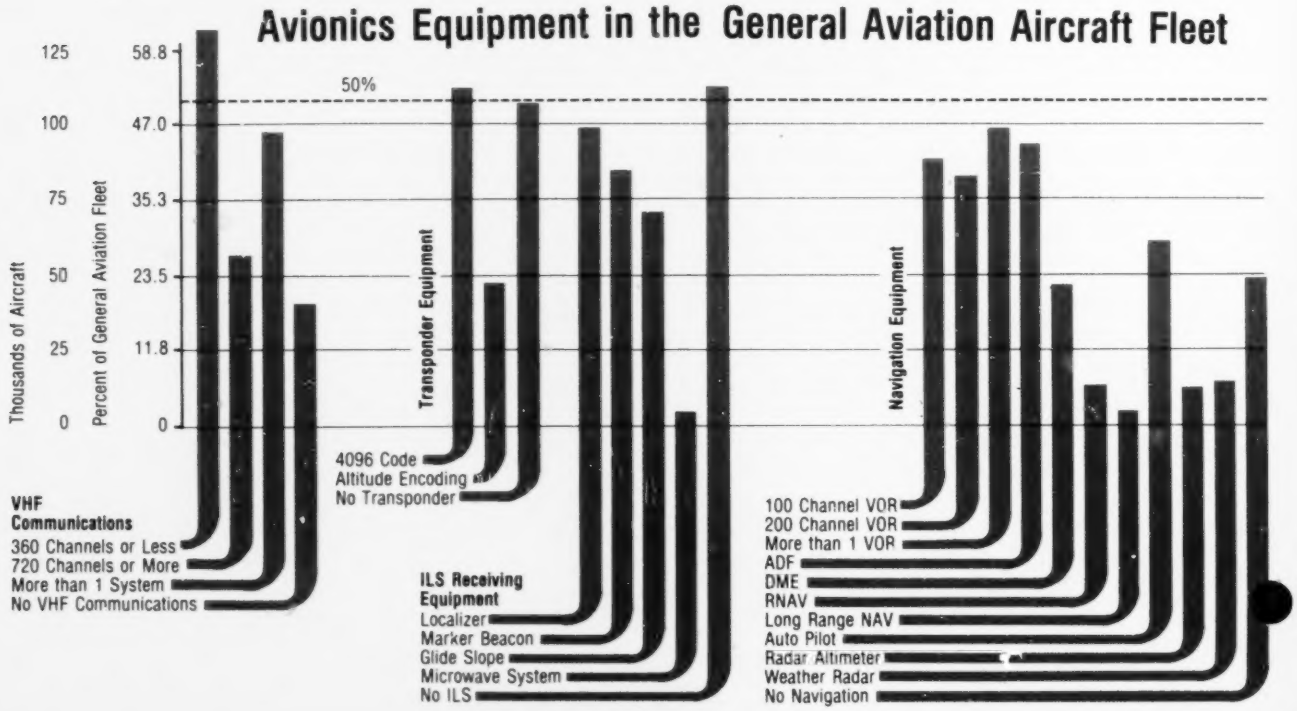
The lower overall hourly flight figures for 1977 compared to 1976 are attributable to the new FAA method of gathering data. While the hours flown by business flyers has increased, the hours flown for personal use declined from 8,828,000 hours in 1974 to 8,453,000 in 1977.

General Aviation Avionics

	VHF Communications				Transponder Equipment				IL
	360 Channel	720 Channel	2 + Systems	No Comm	4096 Code	Alt Enc	No Transponder	LOC	ER BEC
Executive									
Estimated Inventory	3,204	6,103	7,949	41	8,558	7,728	366	8,391	8,197
Estimated % of Use	36.5	69.5	90.5	0.5	97.4	88.0	4.2	95.6	93.3
Business									
Estimated Inventory	26,043	16,851	30,448	1,112	34,576	16,355	7,235	29,950	28,318
Estimated % of Use	62.9	40.7	73.6	2.7	83.5	39.5	17.3	72.4	68.4
Personal									
Estimated Inventory	65,413	14,743	37,834	12,806	38,129	9,823	52,221	35,668	30,358
Estimated % Use	74.1	16.7	42.9	14.5	43.2	11.1	59.1	40.4	34.4
Aerial Application									
Estimated Inventory	1,535	283	423	5,805	418	87	7,187	397	474
Estimated % Use	20.8	3.8	5.7	78.5	5.7	1.2	97.2	5.4	6.4
Instructional									
Estimated Inventory	10,881	5,209	5,563	578	8,477	1,728	7,663	7,958	5,455
Estimated % of Use	67.6	32.4	34.6	3.6	52.7	10.7	47.6	49.4	33.9
Air Taxi									
Estimated Inventory	3,823	3,447	5,204	46	5,581	3,438	1,387	5,761	5,293
Estimated % of Use	55.9	50.8	76.1	0.7	81.6	50.3	20.3	84.3	77.4
Industrial/Special									
Estimated Inventory	916	473	546	28	800	273	577	572	462
Estimated % of Use	68.3	35.3	40.7	2.1	59.6	20.4	43.1	42.7	34.5
Rental									
Estimated Inventory	4,338	3,867	4,863	621	7,173	1,853	1,621	5,538	4,915
Estimated % of Use	50.3	44.9	56.4	7.2	83.2	21.5	18.8	64.3	57.0
Other									
Estimated Inventory	2,415	1,419	1,731	1,289	2,145	1,060	2,918	1,972	1,519
Estimated % of Use	50.3	29.6	36.1	26.9	44.7	22.1	60.8	41.1	31.7
Inactive									
Estimated Inventory	9,143	1,062	2,187	15,414	2,196	530	23,357	2,549	1,961
Estimated % of Use	31.5	3.7	7.5	53.1	7.6	1.8	80.4	8.8	6.8
Total									
Estimated Inventory	127,019	54,283	96,125	37,735	108,189	42,597	104,405	99,335	72
Estimated % of Pop	59.7	25.5	45.2	17.7	50.9	20.9	49.1	46.7	40.6

Business and executive aircraft are installed with a higher percentage of sophisticated communications and navigation avionics, on average, than any other category of general aviation. In many cases, executive aircraft are better equipped than air carrier aircraft.

Avionics Equipment in the General Aviation Aircraft Fleet



Equipment By Primary Use - 1977

Receiving Equipment			Navigation Equipment										
Glide Slope	MLS	No ILS	VOR 100CH	VOR 200CH	2 + RCVR	ADF	DME	RNAV	LRNAV	Autopit	Radar Altimeter	Weather Radar	No Naveq
8,044	32	527	2,480	6,638	8,081	8,514	7,948	3,201	855	7,832	4,330	6,061	114
91.6	0.4	6.0	28.2	75.6	92.0	96.9	90.5	36.5	9.7	89.2	49.3	69.0	1.3
23,474	183	11,026	18,770	22,820	31,424	31,969	19,346	4,009	426	22,594	2,826	2,846	1,590
56.7	0.4	26.6	45.3	55.1	75.9	77.2	46.7	9.7	1.0	54.6	6.8	6.9	3.8
19,466	428	51,330	46,745	29,974	38,412	32,315	9,290	1,618	256	15,014	1,090	708	16,795
22.0	0.5	58.1	52.9	33.9	43.5	36.6	10.5	1.8	0.3	17.0	1.2	0.8	19.0
141	0	6,956	415	374	331	377	141	2	0	48	1	12	6,814
1.5	0.0	94.1	5.6	5.1	4.5	5.1	1.9	0.0	0.0	0.7	0.0	0.2	92.2
5,140	5	7,920	7,126	7,110	5,093	5,642	2,210	508	0	2,623	340	162	2,153
31.9	0.0	49.2	44.3	44.2	31.6	35.1	13.7	3.2	0.0	16.3	2.1	1.0	13.4
4,715	1	1,193	2,158	4,042	5,194	6,054	3,668	514	53	3,655	565	1,464	343
69.0	0.0	17.5	31.6	59.1	76.0	88.5	53.6	7.5	0.8	53.5	8.3	21.4	5.0
364	0	758	640	459	438	568	259	0	32	218	31	48	278
27.2	0.0	56.5	47.7	34.2	32.6	42.4	19.3	0.0	2.4	16.3	2.3	3.6	20.8
4,585	0	3,148	2,132	6,157	4,988	4,897	2,052	319	41	3,669	215	211	567
53.2	0.0	36.5	24.7	71.4	57.9	56.8	23.8	3.7	0.5	42.6	2.5	2.5	6.6
1,241	21	3,012	860	2,029	1,554	1,745	1,052	240	109	992	281	352	2,155
25.9	0.4	62.8	17.9	42.3	32.4	36.4	21.9	5.0	2.3	20.7	5.9	7.3	44.9
1,217	17	22,602	5,817	2,147	2,046	2,124	676	131	33	758	119	174	17,545
4.2	0.1	77.8	20.0	7.4	7.0	7.3	2.3	0.5	0.1	2.6	0.4	0.6	60.4
68,[illegible]	688	107,909	86,556	82,459	97,024	93,782	46,597	10,424	1,805	57,434	9,878	12,054	48,376
32.0	0.3	50.8	40.7	38.8	45.6	44.1	21.9	4.9	0.8	27.0	4.6	5.7	22.8

Note: Column summations may differ from printed totals due to estimation procedures.

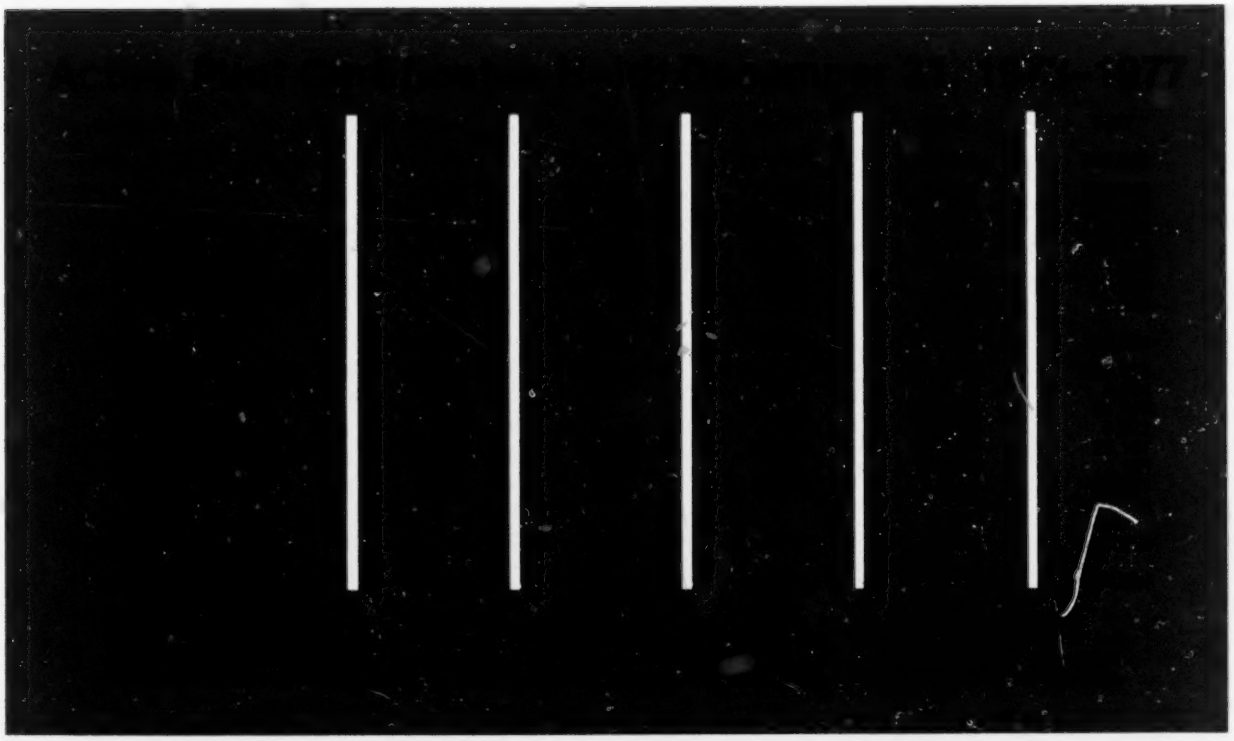
Mini-Glossary and Contractions

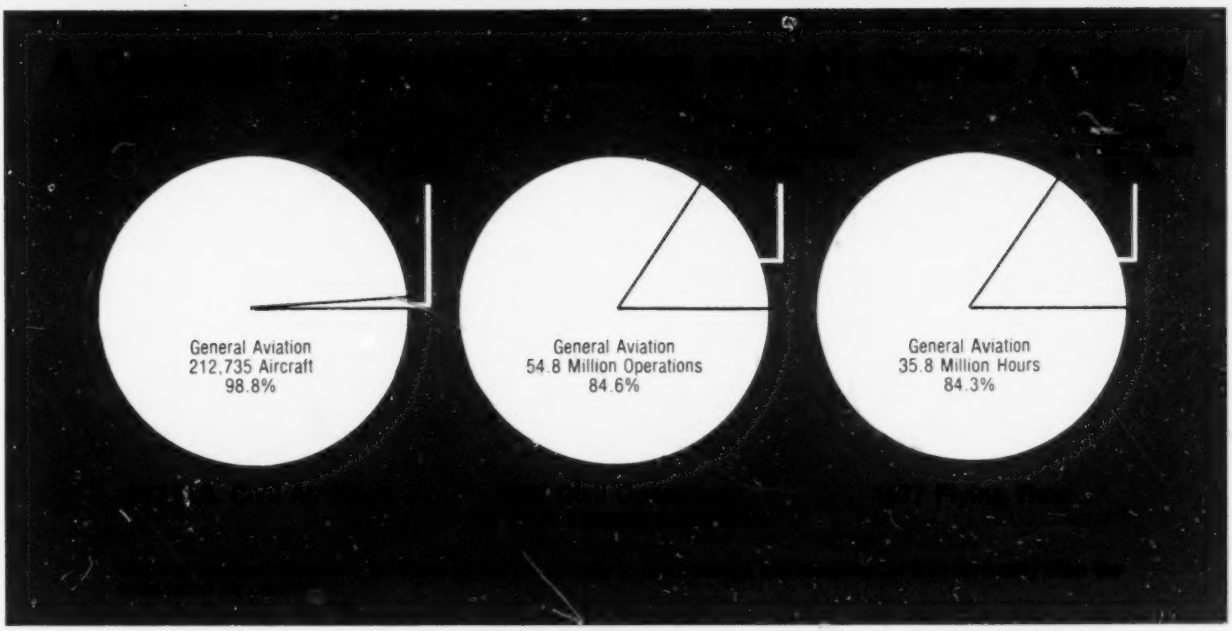
ADF	Automatic Direction Finder
Alt. Enc.	Altitude Encoder (Mode C)
DME	Distance Measuring Equipment
Glide Slope	Provides Vertical Guidance During Approach and Landing
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LOC	ILS Localizer
LRNAV	Long Range Navigation System
MKER BEC	Marker Beacon
MLS	Microwave Landing System
RNAV	Area Navigation
Transponder	Airborne Radar Beacon Receiver/Transmitter
VHF	Very High Frequency
VOR	Very High Frequency, Omni Range

General Aviation Active Aircraft IFR Flown and Transponder Equipped - 1977

Aircraft Type	Estimated Number of Aircraft Flown IFR	Estimated Percent of Active Aircraft Flown IFR	Estimated Number of Aircraft Flown IFR with Transponder	Estimated Percent of IFR with Transponder
Fixed Wing				
Piston				
1 Eng. 1-3 seats	2,324	4.1	1,219	52.5
1 Eng. 4+ seats	37,714	41.0	36,696	97.3
Total 1 Eng.	40,038	26.8	37,915	94.7
2 Eng. 1-6 seats	13,143	87.2	13,143	100.0
2 Eng. 7+ seats	5,751	92.4	5,751	100.0
Total 2 Eng.	18,894	88.7	18,894	100.0
Other Piston	141	77.4	141	100.0
Total Piston	59,074	34.6	56,960	96.4
Turboprop				
2 Eng. 1-12 seats	2,259	99.3	2,254	99.8
2 Eng. 13+ seats	550	100.0	550	100.0
Total 2 Eng.	2,809	99.4	2,807	99.9
Other Turboprop	63	99.3	63	100.0
Total Turboprop	2,873	99.4	2,873	100.0
Turbojet				
2 Eng.	1,893	96.6	1,893	100.0
Other	313	98.4	313	100.0
Total Turbojet	2,206	96.9	2,206	100.0
Total Fixed Wing	64,154	36.5	62,123	96.8
Rotorcraft				
Piston	34	1.3	20	58.4
Turbine	85	4.1	76	89.3
Total Rotorcraft	120	2.5	96	80.4
Other	40	1.1	5	13.9
Total Aircraft	64,314	34.9	62,225	96.8

Note: Column summations may differ from printed subtotals and totals due to estimation procedures





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1980-Section 1

NATIONAL
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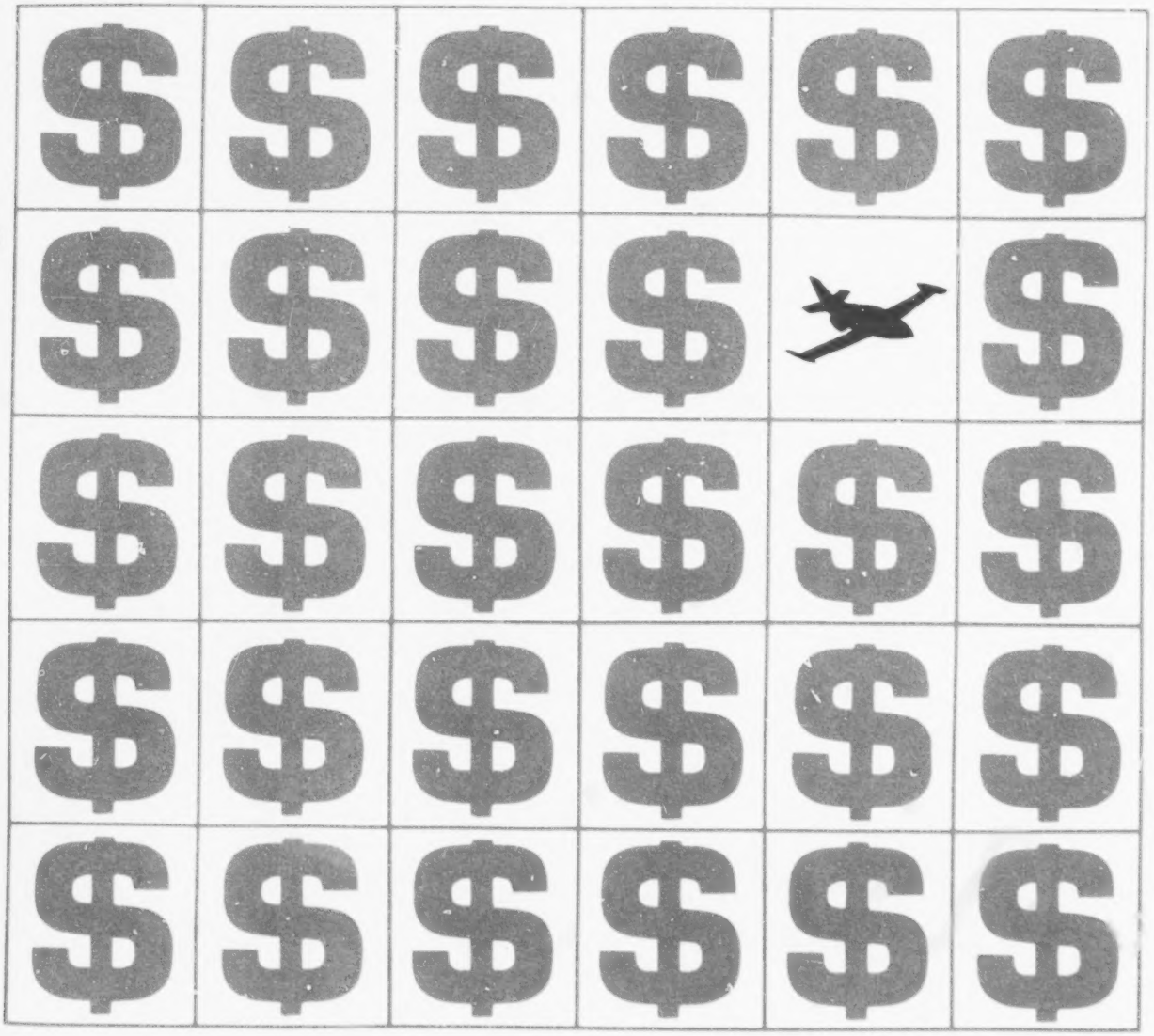
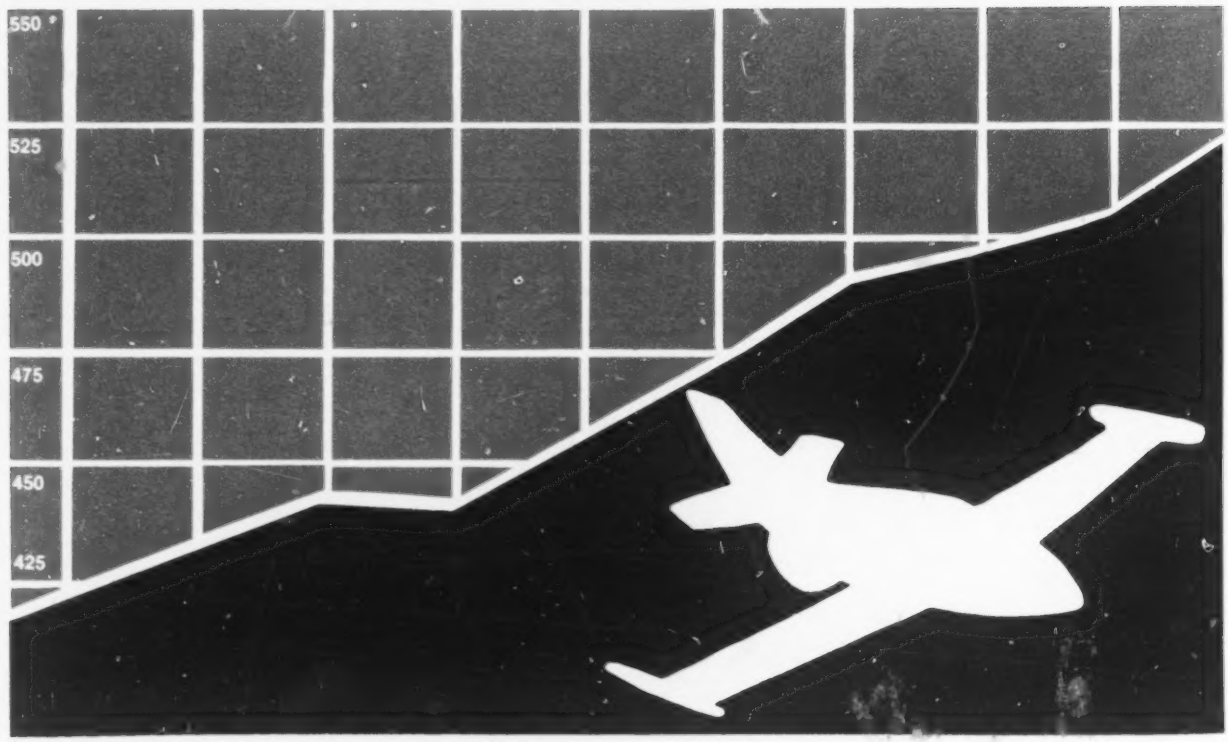
Leading Industrials Aircraft Analysis
The FORTUNE 1,000: 1978 Update



More Leading Industrials Adopt the Company Airplane



Fortune 1,000 companies that own or operate aircraft passed the 50 percent mark in 1977 with 514 companies. The 1978 figures show a gain of eight more companies for a total of 522 companies. The Fortune 1,000, which is based on dollar volume of sales for industrial companies, changes each year based on company records. Each year there are new companies on the list. Other companies drop off. The graph shows an increase in aircraft owners and operators despite changes in individual companies.

A majority of the leading industrial companies of the United States operate business aircraft. Of the 1,000 largest publicly held corporations in the United States, 522 operate one or more business airplanes.

The 1,000 largest industrials are identified by *Fortune* magazine, and the economic performance is reported in the May and June issues of the magazine each year based on the *Fortune* listing of the previous calendar year. Information on companies operating business aircraft and the specifications associated with these companies is an outgrowth of a study done annually by Aviation Data Service (ADS), Wichita, Kansas.

This year's review is based on the *Fortune* 1,000 listing for calendar year 1978.

The company airplane is measured by the same performance standards as any piece of capital equipment owned and/or operated by the industrials. During the 1978 year, the number of companies operating business aircraft grew from 514 to 522, although there was a slight decline in the total number of aircraft operated. At the beginning of 1979, companies operating aircraft had a total of 1768 aircraft, which is down fractionally from 1773 a year earlier.

On the Financial Side

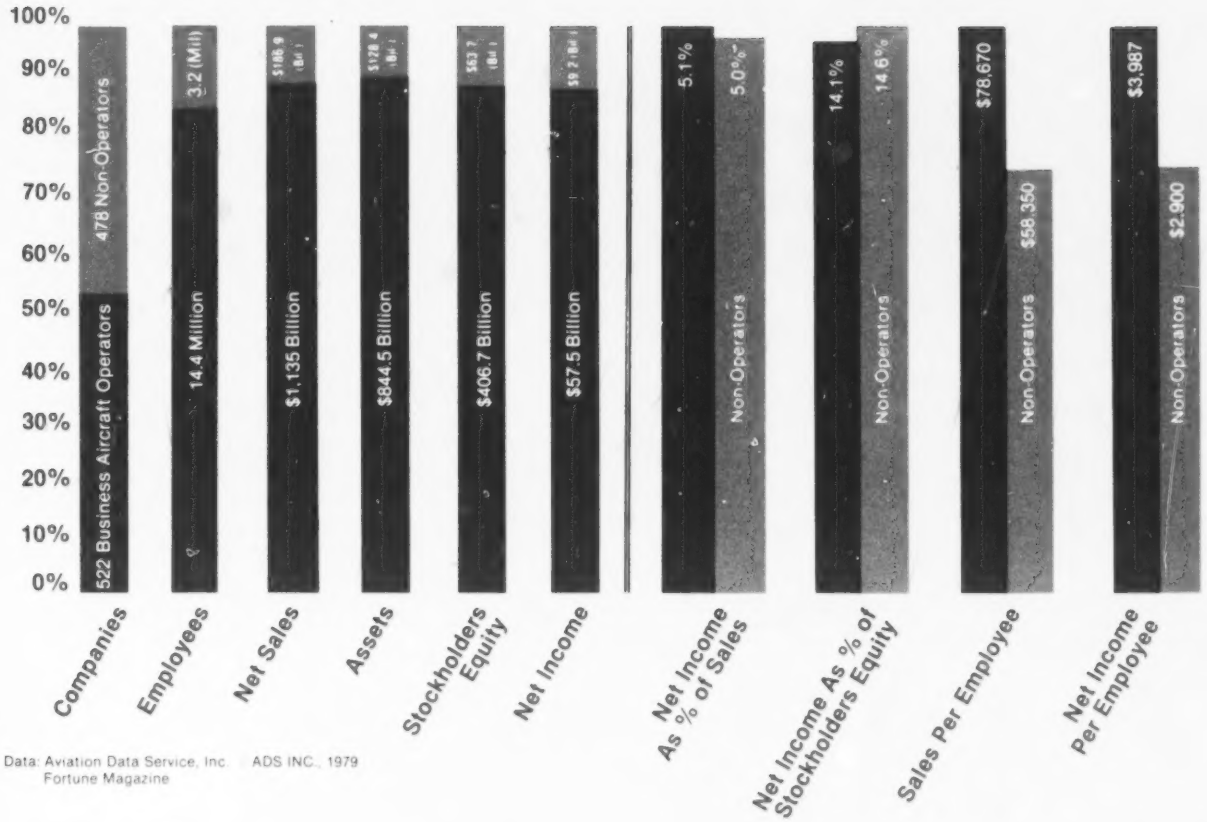
The 522 *Fortune* 1,000 corporations that operated aircraft during 1978 accounted for 84 percent of the sales, 86 percent of the net income, 85 percent of the assets and 80 percent of the total employees. They represented an aircraft fleet at year-end of 1768 units, ranging in size from a J3 Piper Cub up to and including a Boeing 707.

Value of the fleet increased 13 percent during the year, topping the $1.5 billion mark. The number of units in the fleet dropped slightly, to 1768 units from 1773 at the close of 1977.

The majority of super corporations operating aircraft — 67 percent in 1978 — continue to be found among the top 500 industrials. The trend, however, is for a greater increase of aircraft operators among those below the 500 level. Since Aviation Data Service, Inc. began compiling these statistics in 1969, there has been a 42 percent increase in aircraft operators among the second 500 companies, compared to a 19 percent increase among the top 500.

Not surprising, 85 percent of the *Fortune* 1000 fleet is operated by the top 500 and 42 percent by the top 100 companies alone, based on net sales. Only four companies in the top 100 did not operate aircraft during 1978.

Fortune 1000 Summary



Data: Aviation Data Service, Inc. ADS INC., 1979
Fortune Magazine

Business Results Differ Sharply

Among the top 1,000 industrials, the differences in the business results between aircraft operators and non-operators is staggering.

Keeping in mind that there are roughly the same number of operators as there are non-operators — 522 versus 478 — net sales by aircraft-operating companies of $1.134 trillion was over six times that of non-operating *Fortune* companies. Corporate assets for those same 522 aircraft operators were $844.5 billion, or six and a half times those of non-operators; net income of $57 billion was six times greater; stockholders' equity of $406.7 billion was over six times greater; and the 14.4 million employees of operating companies were four and one half times greater than the employment of non-operating companies.

Net income as a percentage of sales averaged 5.1 percent for the top 1,000 industrials operating aircraft as opposed to 5.0 percent for non-operating companies.

In terms of sales per employee, the 522 companies that operate aircraft bettered the non-operating companies by 35 percent, and in terms of assets per employee, by 46 percent. Net income per employee for those companies operating aircraft was a substantial 37 percent higher than those companies tied to ground transportation and/or the commercial airlines.

Employee Productivity

Fortune 1,000 companies operating aircraft completely outpaced non-operating companies in total employment during 1978 — 14.4 million versus 3.2 million, or 81.8 percent of 17.6 million workers.

In 12 SIC industrial categories, employees of non-aircraft operators produced more than their fellow workers at companies with aircraft. The average sales per employee for the aircraft-operating companies were $78,670, or 35 percent better than companies without aircraft. Employees of companies in the category of mining and crude oil production that operate aircraft outperformed their colleagues in non-operating companies by 121 percent.

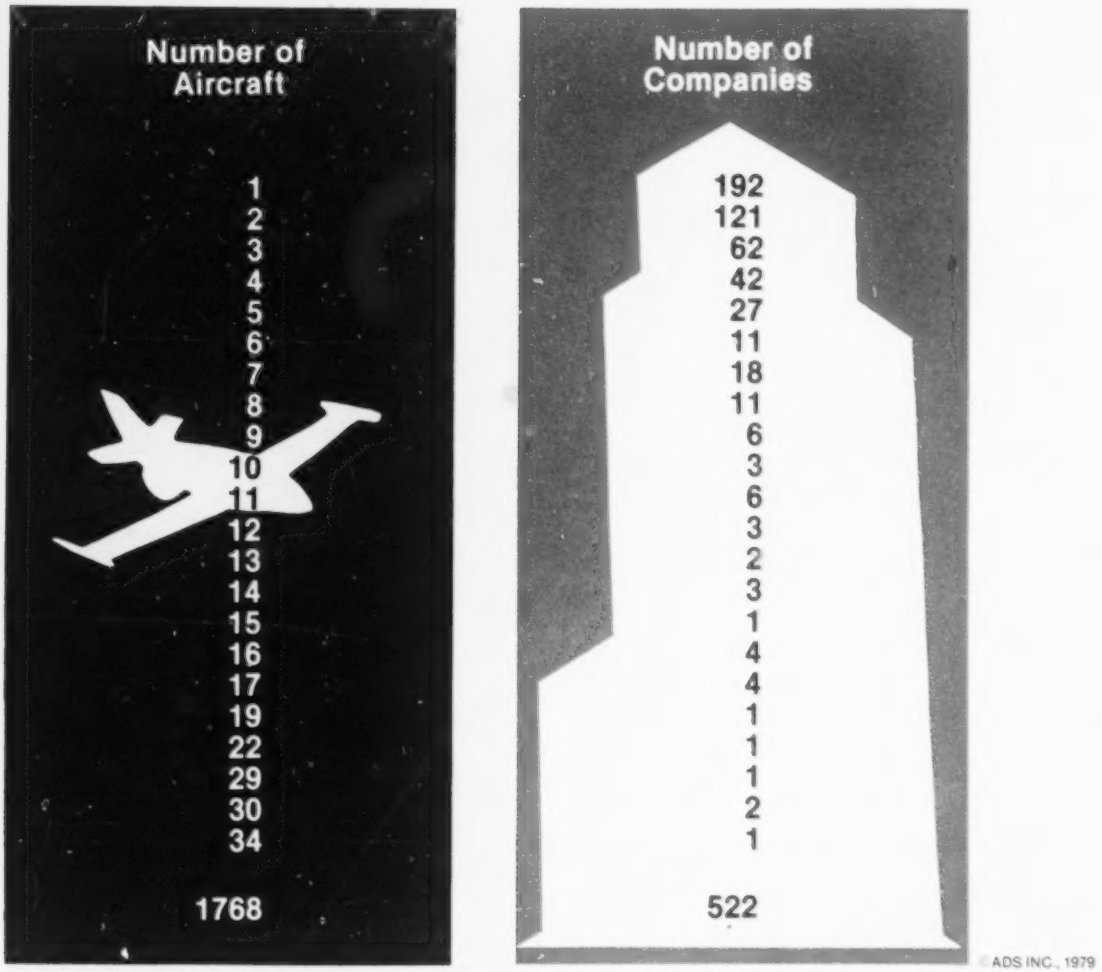
In terms of net income per employee for all the 1,000 industrials, employees of aircraft operators averaged $3,986 each in net income to their companies, 37 percent better than employees of the non-operating companies. In petroleum refining alone, the spread was 394 percent — $13,297 per employee versus $2,691.

Companies

Group	Number			Percentage		
	Operators	Aircraft	Non-Operators	Aircraft	Operators	Total Companies
Mining, Crude Oil Production	22	61	7	3.45	4.21	2.90
Food	52	111	50	6.28	9.96	10.20
Tobacco	7	20	2	1.13	1.34	.90
Textiles, Vinyl Flooring	12	26	24	1.47	2.30	3.60
Apparel	10	19	19	1.07	1.92	2.90
Furniture	3	3	9	.17	.57	1.20
Paper, Fiber & Wood Products	31	111	21	6.28	5.94	5.20
Publishing, Printing	12	33	28	1.87	2.30	4.00
Chemicals	38	133	23	7.52	7.28	6.10
Petroleum Refining	32	280	12	15.84	6.13	4.40
Rubber, Plastic Products	12	42	8	2.38	2.30	2.00
Leather	2	4	3	.23	.38	.50
Glass, Concrete, Abrasives, Gyps	23	57	13	3.22	4.41	3.60
Metal Manufacturing	38	99	29	5.60	7.28	6.70
Metal Products	31	63	37	3.56	5.94	6.80
Electronic Appliances	37	169	36	9.56	7.09	7.30
Shipbuilding RR & Transport Equip	7	10	11	.57	1.34	1.80
Measuring, Scientific, Photo Equip	13	36	23	2.04	2.49	3.60
Motor Vehicles	21	112	13	6.33	4.02	3.40
Aerospace	15	103	1	5.83	2.87	1.60
Pharmaceuticals	12	30	10	1.70	2.30	2.20
Soaps, Cosmetics	4	14	12	.79	.77	1.60
Office Equipment (Computers)	7	29	19	1.64	1.34	2.60
Industrial & Farm Equipment	58	154	38	8.71	11.11	9.60
Jewelry, Silverware	3	5	2	.28	.57	.50
Musical Instr, Toys, Sport Goods	4	7	8	.51	.77	1.20
Broadcasting, Motion-Picture	6	8	6	.45	1.15	1.20
Beverages	10	27	14	1.53	1.92	2.40
Total	522	1768	478	100.00	100.00	100.00

Petroleum refiners operate more aircraft, 280, and represent the largest percentage, 15.84. There are more manufacturers of industrial and farm equipment that own aircraft, 58, but they have fewer aircraft than petroleum refiners, 154 or 8.71 percent.

Comparative Fleet Size



Of the *Fortune* 1,000 companies, 192 own one aircraft. This is also true of the more than 2,100 member companies of NBAA, many of whom are on the *Fortune* list. More than 60 percent of NBAA membership operates one aircraft.

Who Operates Business Aircraft?

Among the 28 categories of Standard Industrial Classification (SIC), the standouts are food processors, petroleum refiners and manufacturers of industrial and farm equipment. Industrial and farm equipment represents the greatest number of *Fortune* 1,000 aircraft operators at 58-60 percent of all companies in that category. Second among operators are food processors, numbering 52.

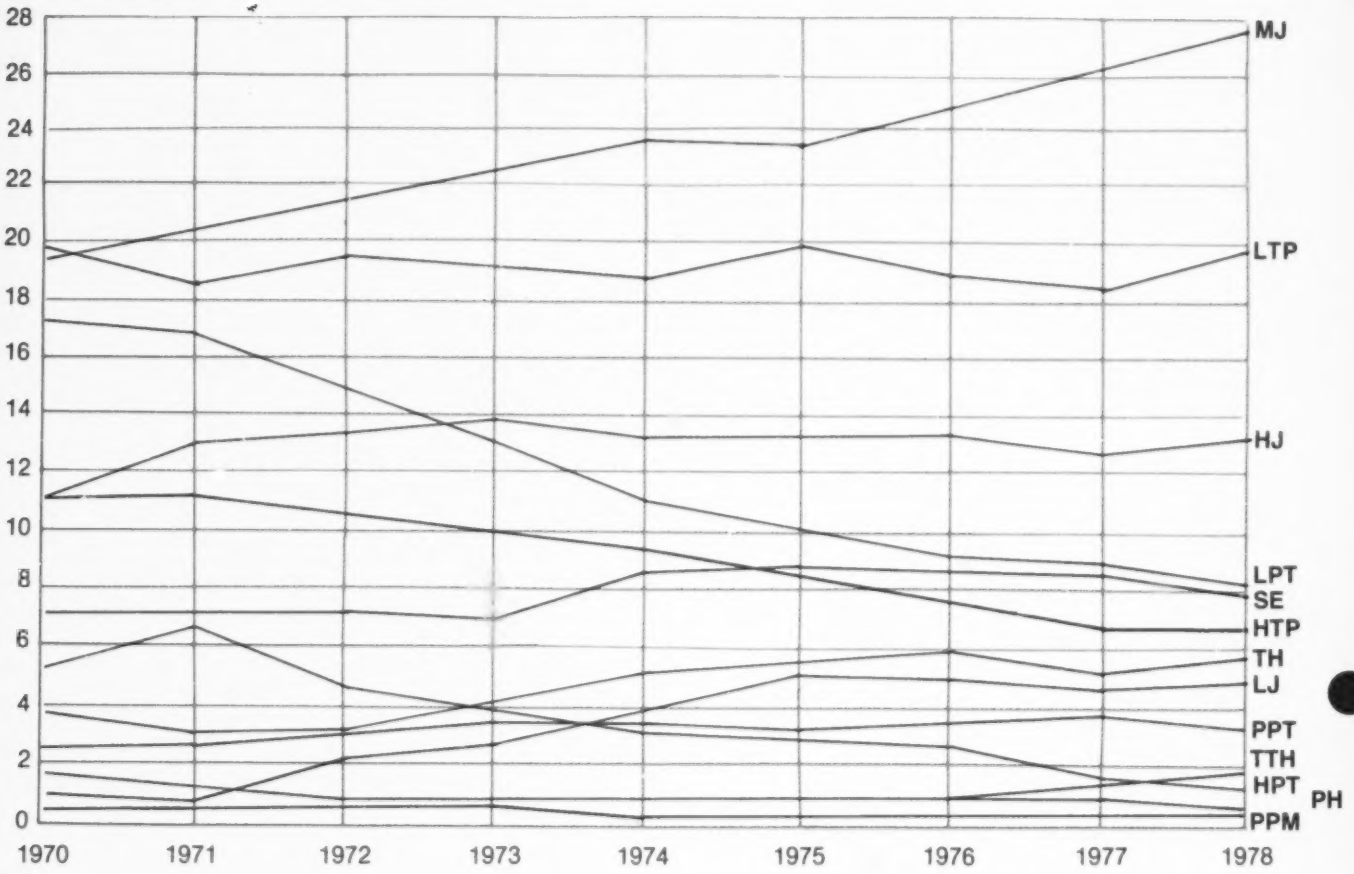
They represent 10.0 percent of the 522 aircraft operators, but only 6.3 percent of the fleet. Petroleum refiners, on the other hand, represent only 4.4 percent of the 1,000 companies, 6.1 percent of those that operate aircraft, and a whopping 15.8 percent of the *Fortune* aircraft fleet. Dropping down to manufacturers of industrial and farm equipment, that category represents the greatest number of operators at 11.1 percent, while accounting for 8.7 percent of the *Fortune* fleet.

Nearly 37 percent, 192 of the 522 operating companies, operate one aircraft. Six companies operate 19 or more aircraft with the largest fleet being 34.

In terms of sales, the leading SIC category among non-operators is food processing with $23.8 million in 1978. They were soundly outdistanced by those *Fortune* 1,000 food processors that do operate aircraft, with $90.1 million. The leader in sales were petroleum refiners with $287.8 million total, of which aircraft operators captured $277.7 million, or 96 percent. This same pattern holds true in terms of corporate assets, net income, and stockholders equity.

Fortune 1000

Aircraft Type As Percentage of Total Fleet



SE Single Engine
LPT Light Piston Twin
PPT Pres. Piston Twin
HPT Heavy Piston Twin
PPM Pres. Piston 4-Eng.
LTP Light Turboprop
HTP Heavy Turboprop
LJ Light Jet
MJ Medium Jet
HJ Heavy Jet
TH Turbine Helicopter
PH Piston Helicopter
TTH Twin Turbine Helicopter
©ADS Inc., 1979

What Aircraft Are Used?

The aircraft "mix" of the *Fortune* 1,000 fleet shows some interesting trends through the years.

The light turboprop led the *Fortune* 1,000 fleet in 1970 with 261 units, or 19.8 percent of the total. Despite a 29.1 percent increase to 337 units, the light turboprop actually declined 0.7 percentage points to 19.1 percent of the *Fortune* fleet by the end of 1978. *Fortune* companies were buying more jets than turboprops by a significant percentage, at least through 1978.

Biggest gainer over the nine-year period was the medium jet, which held down second place at 19.5 percent of the *Fortune* fleet at year end 1970 and jumped 8.3 percentage points to 27.8 percent by the end of 1978. The number of medium-jet units actually increased 91.4 percent during the period, from 257 to 492. Other significant gainers in market share were light jets, up 4.3 percentage points to 5.3 percent of the fleet; heavy jets (JetStars, Gulfstream II's and airline-type aircraft), up 1.8 percentage points to 13.0 percent of the fleet; and turbine helicopters, up 4.6 percentage points to 7.9 percent of the *Fortune* 1,000 fleet.

Light piston twins have been in steady decline since 1970, falling from 227 units to 142. The pressurized piston twins have increased from 32 to 56 units, and the heavy piston aircraft have decreased from 76 to 29 units. Single engine piston aircraft increased steadily from 1970 to 1977, showing a 25 percent increase in 1974 alone. By early 1978, there was a 13% decrease in the *Fortune* 1,000 single engine fleet.

The only other gainer in the *Fortune* 1,000

Supercorporation Fleet Summary

Airplanes	Piston	Turbo Prop	Turbojet	Total
Multi-Engine	2	1	91	94
Single-Engine	129	7	3	139
Twin-Engine	225	438	723	1386
Sub-Total	356	446	817	1619

Helicopters				
Single-Engine	9	108	0	117
Twin-Engine	0	32	0	32
Sub-Total	9	140	0	149
Grand Total	365	586	817	1768

marketplace during the 1970-1978 period was the pressurized piston twin, which increased a percentage point to 3.2 percent of the total fleet.

Other decliners were heavy turboprops, down 4.9 percentage points to 6.3 percent of the fleet; heavy piston twins, down 4.0 points to 1.5 percent of the fleet; and piston helicopters, down 1.1 points to 0.5 percent of the total fleet.

These trends of growth and decline are basically consistent throughout the period and, as such, are reflected in the single-year 1978 results, during which turbine helicopters and medium jets, outpaced the total fleet growth.

Fortune 1,000 aircraft operators spent $307.8 million for new and used equipment during 1978 — a record — and took the total fleet value to just over $1.5 billion, 13 percent higher than the previous year. Of that amount, 38.7 percent, or $603.6 million was accounted for by medium jets, and 39.7 percent, or $619.8 million by heavy jets.

Of the 1,000 *Fortune* aircraft operators, 36.8 percent have one airplane each, while 23 percent operated two. There are 32 companies, or 6.1 percent of the *Fortune* operators, with fleets of 10 or more aircraft each. The largest fleet is 34 aircraft.

The average year of manufacture for the entire fleet is 1970. But for jets it is 1972; turboprops, 1970; pistons, 1968; turbine helicopters, 1973; and piston helicopters, 1965.

All in all, there are 141 different models of aircraft contained in the *Fortune* 1,000 fleet produced by 42 manufacturers. Eight manufacturers alone accounted for 75 percent of the total 1978 fleet and 89 percent of the dollar value. Together, Beech, Cessna, Dassault, Grumman, Hawker-Siddeley, Gates Learjet, Lockheed and Rockwell International represented 1,329 units valued at $1.3 billion.

Beech led in total units with 293, followed by Cessna with 257, Grumman with 210 and Rockwell with 156. Grumman was by far the leader in dollar value with $414.1 million, followed by Lockheed with $213.1 million and Dassault with $186.1 million. The remaining five all accounted for dollar values in excess of $80.0 million.

Supercorporation Fleet Comparative Composition

Ranking Based On Net Sales

Rank	Piston				Turboprop		Turbojet		Helicopter		Total Aircraft
	Single Engine		Twin/Multi Engine								
1-100	75	10%	57	8%	166	22%	344	46%	98	13%	740
101-200	21	6%	49	14%	68	19%	194	54%	24	7%	356
201-300	10	6%	18	10%	45	26%	93	54%	6	3%	172
301-400	4	3%	18	13%	53	37%	60	42%	8	6%	143
401-500	9	10%	21	23%	21	23%	38	42%	1	1%	90
501-600	0	00%	17	22%	23	30%	34	45%	2	3%	76
601-700	1	1%	13	19%	27	40%	22	33%	4	6%	67
701-800	2	4%	11	23%	22	46%	12	25%	1	2%	48
801-900	7	14%	13	27%	12	24%	14	29%	3	6%	49
901-1000	0	00%	10	37%	9	33%	6	22%	2	7%	27
Total	129		227		446		817		149		1768

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1980 - Section 2

NATIONAL BUSINESS AIRCRAFT ASSOCIATION, INC.

Business Aircraft:

1980–1985

Introduction

Get Out the Crystal Ball.

Where is business aviation headed in the 80's? How many aircraft and what kind will business aircraft operators use? How many hours will business aircraft fly? What kind of utilization will the business aircraft operator get? How much will aircraft cost?

There are difficult questions to answer, but aviation department managers must plan for the future and planning needs guidelines.

The Federal Aviation Administration (FAA) issues a yearly forecast that broadly paints a picture for all of avialton. In 1979 they had another survey conducted which deals exclusively with general aviation. The second survey predicts usage of general aviation aircraft by "Primary Use" category. It uses a systems dynamics approach model and was updated based on data through 1976.

"Primary Use" is the division of general aviation aircrarft by mission — business/executive, personal, aerial application, instructional and air taxi. The study was conducted for the FAA by Battelle Columbus Laboratories. "Business Flying" has selected the years of 1980 and 1985 as a basis for comparison.

There are many factors that affect the future of aviation — some economic, some political. The Battelle analysis accounts for various factors. The model is "built upon cause-effect interactions displayed between various sectors of the general aviation system."

One important fact is apparent. Business/executive aviation is gradually becoming a larger part of general aviation. There are many reasons for this. Taxes, fuel and other costs have drastically reduced the emphasis on flying for pure pleasure and there is a continuing healthy trend toward the use of business aircraft as an important and necessary business tool.

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Definitions

The "primary use" categories covered in the following tables are those defined by the FAA:

Business: Any use of an aircraft, not for compensation or hire, by an individual for the purpose of transportation required by a business in which he is engaged.

Executive Any use of an aircraft by a corporation, company, or other organization for the purposes of transporting its employees and/or property, but not for compensation or hire, and employing professional flight personnel for the operation of the aircraft. The terms, "executive" and "corporate" are often used synonymously.

Personal Flying: Any use of an aircraft for personal purposes not associated with a business or profession, and not for hire. This includes maintenance of pilot flight proficiency.

Aerial Application: Aerial application in agriculture consists of those activities that involve the spraying of materials from aircraft in flight, and a miscellaneous collection of minor activites that do not require the distribution of any materials. Generally, this category of flying supports health, forestry, and agricultural activities.

Instructional Flying: Any use of an aircraft for the purposes of formal instruction with the flight instructor aboard, or with maneuvers on particular flight(s) specified by the flight instructor. Excluded is flight proficiency flying after pilot certification and type rating.

Air Taxi: Any use of an aircraft by the holder of an Air Taxi Operating Certificate (FAR Par 135) which is authorized by that certificate (includes operations by commuter air carriers and non-scheduled air taxi operators).

Other: Any use of an aircraft not accounted for by the previous user categories. (Examples: research and development, marketing and sales demonstration, sport parachuting, etc.)

Active Aircraft by Primary Use

	Total	Single Piston	Multi-Piston	Turbo Prop	Turbo Jet	Piston Heli-copter	Turbine Heli-copter
1980							
Total	**228,036**	**178,403**	**28,928**	**3,363**	**2,904**	**3,344**	**2,382**
Business	57,164	44,191	12,290	0	0	683	0
Corporate (Executive)	13,725	2,103	5,795	2,679	2,405	0	74.3
Personal	103,822	99,419	4,008	0	0	395	0
Aerial Spray	9,816	8,712	412	0	0	692	0
Instructional	12,236	11,631	302	0	0	302	0
Air Taxi	9,418	3,226	4,142	519	224	293	1,014
Other	21,857	17,833	1,979	165	276	979	625
1985							
Total	**357,622**	**278,217**	**49,331**	**5,416**	**4,802**	**5,025**	**4,205**
Business	109,210	84,788	22,983	0	0	1,439	0
Corporate (Executive)	21,115	3,315	8,248	4,317	3,925	0	1,309
Personal	144,661	137,997	6,124	0	0	539	0
Aerial Spray	11,972	10,626	502	0	0	844	0
Instructional	12,544	12,028	211	0	0	304	0
Air Taxi	16,955	5,809	7,457	934	403	527	1,825
Other	41,166	34,280	3,805	165	474	1,371	1,071

Percent of Active General Aircraft Fleet by Primary Use

	1980	1985
Business/Corporate (Executive)	30.7	36.4
Personal	45.5	40.4
Aerial Application	4.3	3.3
Instructional	5.3	3.5
Air Taxi	4.1	4.7
Other	10.1	11.7
	100.0	100.0

In the next five years, according to the FAA-sponsored Battelle Study, the number of business/executive aircraft will increase by almost six percent. The overall figures for the total amount of aircraft and the amount of each aircraft by type may be difficult to predict with accuracy, but the trend toward more business aircraft is clear.

The Battelle study consistently predicts a higher total of general aviation aircraft than the FAA's own method. "Business Flying" indicates trends. It does not question which method of predicting is more accurate. The FAA uses a sampling method. The Battelle study uses a systems dynamic model. The FAA uses the Battelle study as a policy guide.

Hours Flown *(thousands)*

	Total	Single Piston	Multi-Piston	Turbo Prop	Turbo Jet	Piston Helicopter	Turbine Helicopter
1980							
Total	**45,162**	**30,109**	**7,574**	**1,530**	**1,389**	**1,006**	**1,142**
Business	9,353	6,894	2,349	0	0	110	0
Corporate (Executive)	4,575	471	1,905	786	1,148	0	264
Personal	10,906	10,340	557	0	0	10	0
Aerial Spray	2,680	2,410	70	0	0	198	0
Instructional	5,093	4,850	166	0	0	77	0
Air Taxi	4,921	1,378	1,968	689	148	148	591
Other	7,633	6,176	559	55	93	463	287
1985							
Total	**71,641**	**48,147**	**12,803**	**2,081**	**2,270**	**1,425**	**2,018**
Business	17,686	13,227	4,306	0	0	152	0
Corporate (Executive)	6,358	743	2,620	746	1,835	0	414
Personal	15,216	14,352	851	0	0	13	0
Aerial Spray	3,217	0	84	0	0	238	0
Instructional	5,197	4,950	169	0	0	78	0
Air Taxi	9,146	2,561	3,658	1,280	274	274	1,098
Other	14,820	12,315	1,115	55	160	669	507

Percent of Hours Flown

	1980	1985
Business/Corporate (Executive)	30.8	33.6
Personal	24.1	21.2
Aerial Application	5.9	4.5
Instructional	11.2	7.3
Air Taxi	10.9	12.8
Other	17.1	20.6
	100.0	100.0

The total amount of hours flown by business/corporate operators are consistently higher than any other type of general aviation aircraft. By 1985 the percentage of hours flown by business/corporate aircraft are expected to represent an even larger part of total general aviation flying hours by another almost three percent or more. The official FAA tally for 1978, the latest year for which actual figures are available, show that business and corporate aviation represented 32.7 percent of all general aviation flying hours, up 3.9 percent from 1977. This is a graphic example of the growing trend of increased usage of business aircraft and a lessening of the use of general aviation aircraft for other uses, expecially personal. Energy costs and taxes account for a large part of this change. If current trends in actual FAA figures continue, the prediction of 33.6 percent for the amount of business/corporate aircraft hours flown could be low.

Operations *(thousands)*

	Total	Single Non-Spray	Multi-Piston	Turbo Prop	Turbo Jet	Piston Heli-copter	Turbine Heli-copter
1980							
Total	**133,376**	**99,191**	**15,267**	**3,503**	**2,244**	**4,281**	**3,078**
Business	19,487	14,822	4,393	0	0	273	0
Corporate (Executive)	8,039	853	3,335	1,140	1,860	0	851
Personal	34,264	33,067	1,125	0	0	52	0
Aerial Spray	6,828	0	50	0	0	964	0
Instructional	29,697	27,696	766	0	0	1,234	0
Air Taxi	11,413	3,279	4,055	2,191	205	337	1,346
Other	23,649	19,454	1,543	172	178	1,421	880
1985							
Total	**201,560**	**148,861**	**25,813**	**5,326**	**3,660**	**5,531**	**5,392**
Business	36,867	28,438	8,053	0	0	376	0
Corporate (Executive)	11,318	1,344	4,585	1,081	2,973	0	1,334
Personal	47,716	45,926	1,719	0	0	71	0
Aerial Spray	8,196	0	60	0	0	1,157	0
Instructional	30,296	28,266	782	0	0	1,248	0
Air Taxi	21,213	6,095	7,537	4,072	381	626	2,502
Other	45,955	38,792	3,076	172	306	2,053	1,555

Aircraft operations are another indication of the increase in business aircraft activity. By 1985 the business and corporate aircraft will command almost 24 percent of all general aviation aircraft operations. Business/corporate aircraft operations will surpass the current leader, personal aircraft. Looking back to 1976 by comparison, the number of business/corporate operations were 34.5 percent 1 less than personal aircraft operations.

Percent of Operations

	1980	1985
Business/Corporate (Executive)	20.6	23.9
Personal	25.7	23.6
Aerial Application	5.1	4.1
Instructional	22.2	15.0
Air Taxi	8.6	10.5
Other	17.8	22.9
	100.0	100.0

Aircraft Utilization Rate *(Hours/AC/Year)*

	Single Piston	Multi-Piston	Turbo Prop	Turbo Jet	Piston Heli-copter	Turbine Heli-copter
1980						
Business	156	191	0	0	154	0
Corporate (Executive)	224	327	267	476	0	351
Personal	104	139	0	0	25	0
Aerial Spray	289	17	0	0	299	0
Instructional	421	553	0	0	256	0
Air Taxi	459	511	1,427	709	542	627
Other	387	315	332	338	475	460
1985						
Business	156	187	0	0	106	0
Corporate (Executive)	224	318	173	463	0	316
Personal	104	139	0	0	25	0
Aerial Spray	280	172	0	0	292	0
Instructional	412	761	0	0	256	0
Air Taxi	523	581	1,627	807	617	713
Other	426	347	332	338	488	473

According to the Battelle study, there will not be an appreciable difference in the utilization rate of aircraft. The amount of hours an aircraft is used per year will remain fairly static. Variations in the utilization rate will depend largely on the amount of increases in taxes on general aviation and the increase in the cost of fuel.

Pilots

	1980	1985
Student Pilots	182,384	178,248
Private Pilots	352,437	374,399
Commercial Pilots	199,209	222,700
Air Transport Pilots	56,656	71,413
Pilot Subtotal	790,685	846,759
Helicopter Pilots	3,322	2,187
Total Pilots	794,007	848,946
Instrument Ratings	255,978	318,202
Helicopter Ratings	28,347	34,786
Total Helicopter Ratings	31,669	36,973

The Battelle study for the FAA, when compared to the actual FAA forcast, shows a more conservative estimate of the amount of pilots. In 1985 for instance, the FAA forecast estimates that there will be 891,000 pilots compared to the 848,000 listed by the Battelle study.

Aircraft Cost ($/Year),

(1972 $, = 1)

	1980	1981	1982	1983	1984	1985
Single Piston	1.183	1.195	1.217	1.240	1.262	1.285
Multi-Piston	1.241	1.253	1.277	1.300	1.324	1.347
Turbo Prop	1.135	1.146	1.168	1.189	1.211	1.233
Turbo Jet	1.218	1.230	1.253	1.276	1.299	1.322
Piston Helicopter	1.270	1.283	1.307	1.331	1.355	1.379
Turbine Helicopter	1.220	1.232	1.255	1.278	1.301	1.325

The Battelle study offers a guideline for aircraft purchases by type of aircraft based on the 1972 dollar as one. According to the survey, aircraft prices will rise at a slower rate than the average current rate of inflation. Since the survey is based on a gradual increase in the economy, not abnormal peaks and valleys, the lower rate of cost increases may be justified over the long run.

Totals for Aircraft, Hours Flown and Operations, 1980 — 1985

	1980	1985
Total Aircraft	228,036	357,622
Total Hours Flown (Thousands)	45,162	71,641
Total Operations	133,376	201,560

Estimated figures are certain to differ over a period of years, but the trend is clear. Business/corporate activity in every category is on the increase. More and more of the general aviation economy is now represented by business/corporate aircraft operations and this activity will continue into the 1980's.

Distribution

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